April 19, 1948

STEEL

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The Magazine of Metalworking and Metalproducing

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EDITORIAL INDEX, PAGE 35

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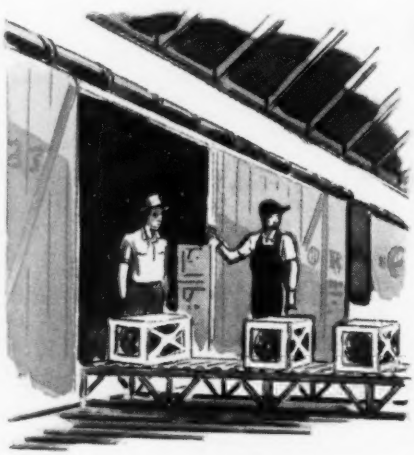

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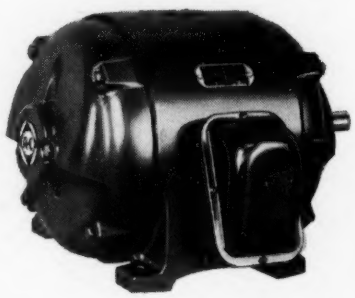

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STEEL

The Magazine of Metalworking and Metalproducing

VOL. 122, NO. 16 APRIL 19, 1948

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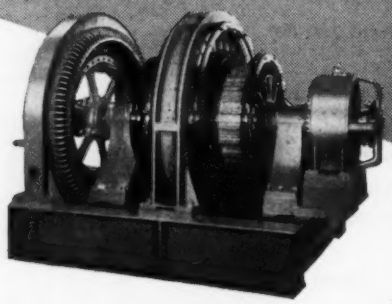

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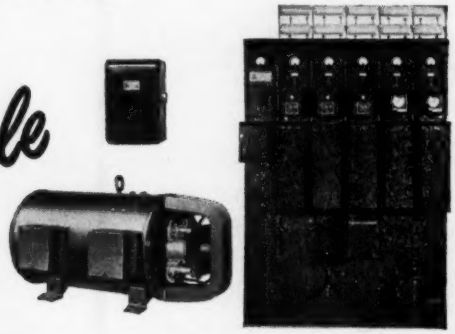

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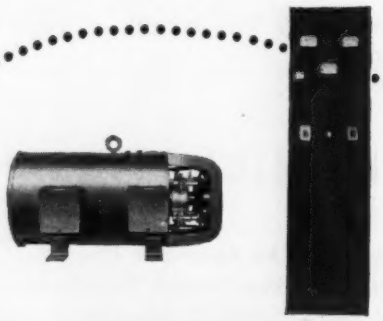

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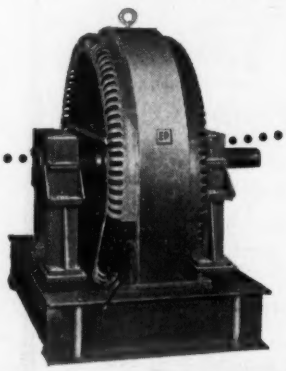

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April 19, 1948

Intolerable Situation

It would be ridiculous to think resumption of coal mining means the nation has heard the last of John L. Lewis for some long time to come. Regardless of the outcome of the contempt proceedings against him for ignoring for more than a week the federal court's order directing him to halt the strike, there is widespread suspicion more will be heard from Lewis when the miners' contract with the operators expires. The April work stoppage, many think, was but the prelude to trouble come June.

Past experience holds out little promise the powerful mine labor boss will let a fine or court reprimand stay his hand for long; especially now that his appetite has been whetted by substantial victory for his pension demands. Lewis is not the type of labor leader who is easily discouraged, and it would be illogical to assume that a setback in court on the contempt charges will dissuade him from pressing for other advantages for his followers.

Settlement of this latest coal strike obviously does not solve the coal labor problem which has perennially plagued the nation for so long. Mining, to be sure, is being resumed slowly and doubtless the immediate threat of industrial paralysis has been removed. Industry in general, however, is going to feel the effects of this strike for months to come. Much urgently needed production was lost during the period of the strike and more will be lost pending return of industrial operations to pre-strike levels. No one knows how long this will take. In steel, it is estimated, total loss of production directly attributable to the coal strike will exceed well over 1 million tons before pre-strike steel operating rates are regained. This steel loss never can be recouped and, as a result, the supply difficulties of countless consuming industries will be intensified at a time when the demands upon them for military defense and European rehabilitation are mounting.

How much longer will the nation temporize with such irresponsible labor leaders as John L. Lewis? Isn't it time the power of labor barons typified by Lewis be curbed through enactment of foolproof and holeproof laws that will prevent the exercise of monopolistic labor control over the economy of the country? So long as they have free rein the nation will continue under the constant threat of economic disruption at their whim. Such a situation is intolerable.

* * *

FOREIGN ASSISTANCE: The nation has embarked upon the biggest promotional undertaking in history. Under the newly enacted Foreign Assistance Act of 1948 we are launching a concerted program to mend the sick economies of those European countries outside the iron curtain, and of China, and upon its success may rest the peace and economic stability of the world for many long years to come.

It would be idle to hold this country's aims in providing assistance to foreign nations are wholly altruistic. One would be naive indeed to think so. Admittedly we have an axe to grind. Humanitarian motives figure in the grants of aid, assuredly, but still more is the recognition that early economic recovery in Europe is imperative to world political stability, and that such is urgently required if America is to prosper.

Appointment of Paul G. Hoffman, president of the Studebaker Corp. and head of the Committee for Economic Development, to administer the aid program gives assurance that the vast expenditures contemplated ($6 billion has been authorized for the first year) will be in the

(OVER)

hands of an able businessman who in private life has demonstrated his ability to turn in a superb performance.

That we are gambling vast sums of money and precious material resources on a venture for which there is no assurance of success is obvious. However, most competent observers of the world scene think it a good gamble. Risk of war may be involved in undertaking European assistance in the face of Russia's bitter opposition, but it is a risk that must be taken if the threat to political and economic freedom in the world is to be combatted. —p. 50

* * *

MASTER TOOLS: An extraordinary fact brought out at the 46th spring meeting, National Machine Tool Builders' Association, Chicago, is that "the Master Tools of Industry" were overlooked when the Marshall Plan was drafted. Commenting on this, Raymond Moley, guest speaker at the meeting, said: "Machine tools will make the European Recovery Program something more than a temporary stimulant. Food, raw materials and ordinary machinery merely are crutches. Machine tools are the means for permanent recovery."

Fortunately, this oversight was detected by the association in time for influential members to camp on the doorsteps of influential political figures in Washington. As a result of this "industry selling job" there now is every reason to believe that machine tools have won their rightful place in the program. —p. 49

* * *

MILITARY BUYING: Promise of early heavy buying for accelerated defense programs figures prominently in the thinking of industrialists these days. Production plans for coming months necessarily must be more or less fluid to allow for the impact of sudden military demands.

In this connection it is heartening to know that military purchasing procedure for the first time in history will be uniform for all branches of the armed services. Under Public Law 413, which becomes effective May 19, buying procedure has been streamlined. This law, according to Lt. Comdr. Joseph L. Howard in an article in this issue of STEEL analyzing new military buying procedure, not only provides the kind of procurement authority the military services need to meet a crisis, but, also, it contributes greatly to elimination of confusion among suppliers. —p. 46, 69

AIR-BORNE CHIPS: It is interesting to observe that as speeds and feeds in metal cutting have approached those long prevailing in woodworking, various methods followed in the woodworking industry are being applied in the machine shop.

A good example is presented by H. M. Nichols, Sturtevant Division, Westinghouse, in his article in this issue describing how chips can be sucked away from machine tools, carried through conduits and discharged into hopper-bottom storage tanks—much as saw dust and planing chips are handled in large saw mills.

With the advent of carbide tools conventional "chip pans" on machine tools have become inadequate to take care of the tremendous volume of chips which pour into them. While Mr. Nichols does not present his "vacuum cleaner" system as a cure-all, it certainly is an answer to the question, "How can chip removal keep pace with production?" on large-scale cast iron machining. —p. 81

* * *

IMPORTANT RULINGS: Two rulings handed down by the National Labor Relations Board last week will have important bearing on the conduct of labor relations over coming months.

In one instance the NLRB rejected the contention that the Taft-Hartley law requires it to hold a separate election among skilled craftsmen whenever such an election is requested by a craft union. This ruling, it would seem, removes for the present at least the fear of some labor experts that the Taft-Hartley law opened the way for breaking up into small units the large industrial unions through granting of bargaining rights to craft unions which would act for their members apart from the production employees.

The second important ruling of the board held that employers are required to bargain with employees on pensions, if such is requested. Unless overthrown in the courts this ruling would seem to bring the whole subject of pension and retirement plans into the scope of compulsory bargaining. As a result, there is likely to be intensification of union campaigns for pensions and other welfare benefits. —p. 44, 45

William M. Rooney

NEWS AND MARKETS EDITOR

News Summary

STREAMLINED PROCUREMENT—With the United States embarking upon a military preparedness program that may assume vast proportions (p.46), the procedures and regulations being established for military buying are of unusual interest to metalworking executives. Public Law 413, establishing uniform buying procedures for all the armed services, and which becomes effective May 19, is designed to modernize procurement and to simplify the task of industrial mobilization (p. 69). Bulk of purchases will be made under competitive bidding, under the new law, but provision is made for procurement by negotiation under certain situations.

LOST: MILLION TONS OF STEEL— The coal, steel and metalworking industries are counting their losses (p. 43) as result of the walkout of John L. Lewis' coal miners over a pension dispute. Nearly a million tons of ingots already have been irretrievably lost. Experiences in the other five postwar coal stoppages indicate further substantial losses will be incurred before steelworks operations recover to prestrike rate. Steel users are beginning to feel the added pinch as finished steel shipments to metalworking plants are curtailed. The effect on steel consumers will show up more clearly in third quarter quotas.

PENSIONS FOR WORKERS— John L. Lewis' victory in gaining $100 a month pensions for coal miners when they reach 62 will prompt other union leaders to seek similar security for their members. Such demands already have been made in major industries and are given further support and encouragement in last week's ruling by the National Labor Relations Board (p. 44) that employers must bargain on pensions if asked to do so by employee representatives.

CRAFT UNIONS DISCOURAGED— Another National Labor Relations Board ruling of far-reaching import denied elections for bricklayers in two steel plants for the purpose of setting up separate craft unions for these skilled employees. The Taft-Hartley law provides that such craft unions may be established at the discretion of the board if requested by the craft workers involved. This caused some apprehension among industrial relations experts who saw the possibility of widespread "balkanization" or breaking up of the large industrial unions into many small craft unions. This would complicate tremendously the job of negotiating agreements. Apparently the NLRB will not encourage such a movement.

FOREIGN AID—The European economic co-operation plan, with billions of dollars of aid from the United States, is termed (p. 50) the "biggest promotional undertaking in the world's history." Under the administration of Paul G. Hoffman, former Studebaker president, the program already is starting to roll. The powers, materials and aims of the plan are tremendous.

BREAKING IN DIFFICULT—Newcomers to the automotive industry generally have found getting started in production an extremely difficult task. Only one actually is turning out cars on a production basis; the remainder still are tangled up in the procurement of plants, equipment and materials and have not yet gotten out of the paper work stage. At least five would-be producers (p.57) are struggling to reach the productive stage.

SIGNS OF THE TIMES— As result of the coal strike, industrial production continues to slump (p. 62), the loss of coal negating the influence of high domestic demand and increasing requirements for foreign aid and military preparedness . . . . Ford Motor Co. has doubled the size of its paper mill at the Rouge plant (p. 58) to meet production requirements for new models. More than 40 pounds of paper is used in each new car . . . Steel Co. of Canada will spend (p. 55) more than $13 million for expansions . . . . The Klockner-Humbolt-Deutz diesel engine laboratory, formerly located in Germany, has been awarded (p. 60) to Oklahoma A. & M. College. . . . . Russia, because of the newness of her industrial plants, may have an average age of machine tools lower than that in the United States, machine tool builders (p. 49) were told last week in Chicago.

Steel Hard to Get?

Demand Still Exceeds Supply But . . .

. . . this is a typical view of night loading operations at a Ryerson steel-service plant. The steels specified on several orders are on their way to a loading platform for delivery the following morning. Possibly none of these orders are completely filled—however, the fact remains, we are doing our very best to serve a large group of steel users.

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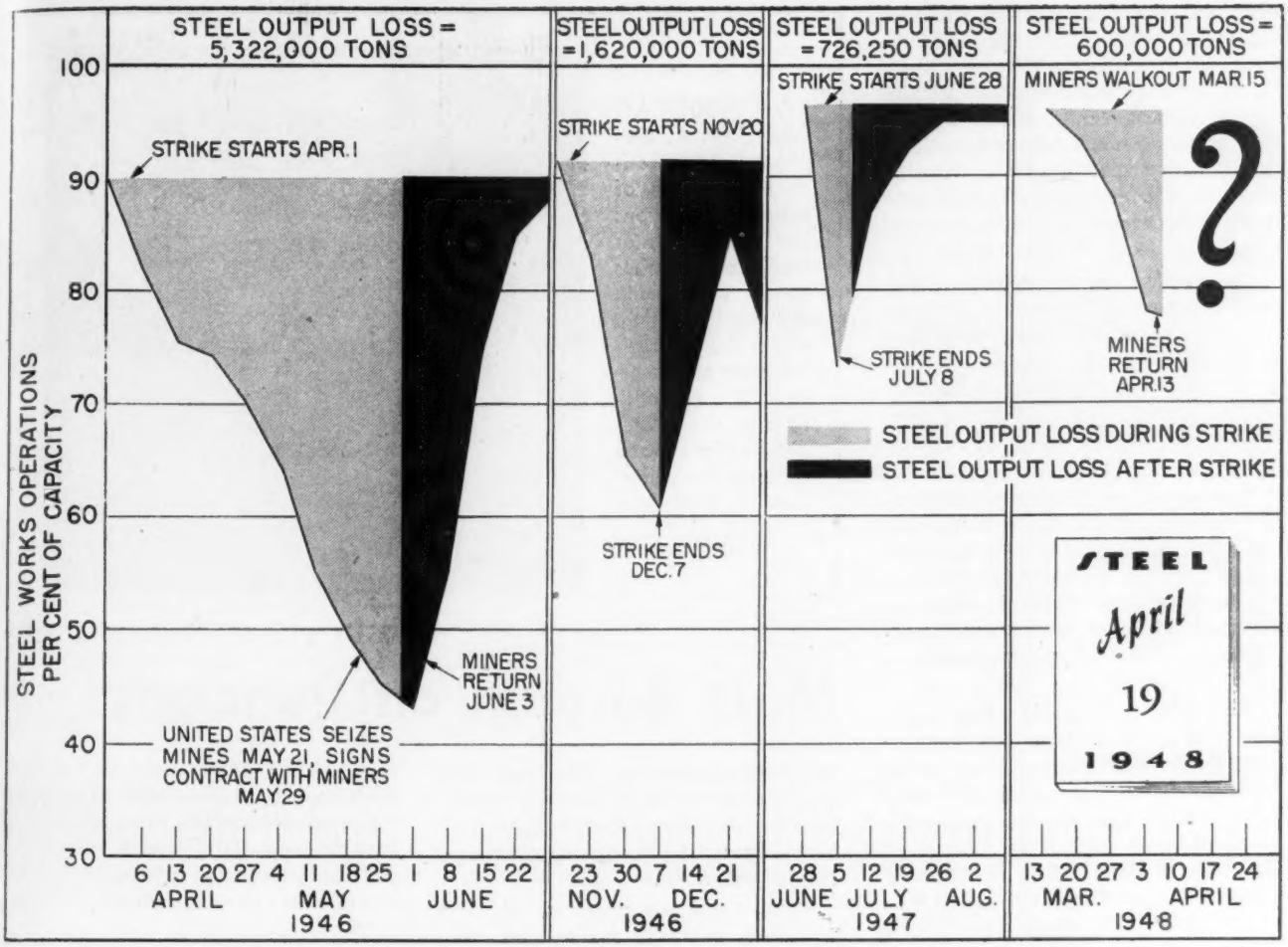

About one-third of the steel production lost as result of postwar coal strikes has occurred after the coal strikes have been settled and the miners returned to work. Substantial recovery in steelmaking generally is achieved in a week or 10 days after the mines reopen although several weeks are required to place some facilities back in operation. Chart shows losses in four of the six major work stoppages since V-J Day

Coal Strike Losses Hit Steel Users

Shipments of finished products to consumers shrink as ingot production loss nears million-ton mark. Two to three weeks to be required for recovery to pre-strike operations

METALWORKING companies are beginning to feel the effects of the coal strike in lowered receipts of steel, and shutdowns for lack of materials will spot the industrial production picture in coming weeks.

The loss of steel production caused by the miners' walkout, coupled with increased requirements for the expanding military program and for foreign aid, have pushed ahead the date when a balance between steel supply and demand will be reached.

Steel producers at the end of last week counted their production losses at 930,000 tons of ingots. This figure will be pushed well above the million-ton mark before substantial recovery from the mine idleness is effected.

Among finished products, the greatest curtailment to date has been in structurals, plates, bars and rails, with pipe and wire affected to a lesser extent. Sheet and tin plate schedules continue well sustained.

Poststrike Losses Heavy — Examination of steel production losses in previous postwar coal strikes (see chart above) shows that approximately one-third of the total steel output loss occurred after a coal strike had been settled and the miners had returned to the pits. The April-May strike of 1946, for example, cost 5,322,000 tons of steel; 1,789,000 tons of this was lost after the government had seized the mines and signed a contract with John L. Lewis. In November of the same year, when the miners struck against the government, 456,000 tons of steel were lost after the miners returned, against 1,164,000 tons during the strike. The walkout preceding the return of the mines to private operation last June caused a loss of three quarters of a million tons of ingots, more than a third of which occurred after the mines had resumed operation.

A week or more is required to move coal to the more remote steel mills after the mines reopen. A week or ten days is required for iron and steel plants to get back to near normal operations. Producers estimate two to three weeks will elapse before substantial recovery to pre-strike production is achieved.

Miners Win Pensions—The issue causing the coal mine walkout—pen-

sions for the miners—was resolved early last week after the appointment of Sen. Styles Bridges (Rep., N. H.) as neutral trustee of the miners' welfare fund. A compromise agreement gave the miners practically everything their president, John L. Lewis, had asked: $100 a month pension for miners retiring at the age of 62 with at least 20 years of service.

This settlement was followed by a partial return of the miners, but the majority remained away from the mines pending the outcome of the government's contempt action against Lewis for refusing to honor a government injunction against the walkout.

Resumption of mining as well as the resumption of steelmaking was hindered in some districts by flood conditions. Andrews Steel Division of International Detrola Corp. at Newport, Ky., suspended both steelmaking and rolling operations on account of high water.

Coal Stocks Depleted—Steel mills used the bulk of their coal reserves during the coal stoppage and stand little chance of rebuilding stockpiles to anywhere near normal before the next probable coal crisis occurs at the end of June when the miners' contract expires and when Lewis is expected to ask for a third round wage increase. All industry will be in a vulnerable position if the mines are shut down again at that time and the effect of a coal stoppage on steel mill operations will be felt much more quickly.

Incidentally, the miners also will be more vulnerable, as they have had to draw heavily upon savings accounts and bonds during the March-April stoppage. The miners are estimated to have lost between $130 and $140 million in wages during the walkout.

Upsets Steel Target — The coal strike has set back the steel industry's attempts to set a new peacetime steel production record this year. Last year's 84.7 million tons set a peacetime record and producers had figured that increased capacity would enable them to beat the 1947 mark by possibly 4 million tons, should no interruptions occur.

First quarter output was slightly more than 22 million tons, compared with 20,943,000 tons in the first three months of 1947. Output for the current quarter is almost certain to fall below the 21,340,000 tons produced in the second quarter of 1947.

Altogether, the six postwar coal strikes are estimated to have cost the country more than 10 million tons of steel production.

TOP NEGOTIATORS: John A. Stephens, vice president in charge of industrial relations for United States Steel Corp., shakes hands with Philip Murray, president of the United Steelworkers of America-CIO. Negotiations on the union's demand for a wage increase are underway at Pittsburgh. NEA photo

Must Bargain on Pensions

UNIONS demanding pensions and more comprehensive welfare plans for their members gained support and encouragement from two developments last week.

First came the approval of $100 a month pensions for miners who had reached the age of 62 and who had served the industry for 20 years or more.

Second came a decision by the National Labor Relations Board that employers are required to bargain with employees on pensions if asked by the employees.

Renewed and intensified campaigns for pensions and other welfare benefits may be expected from practically all industrial unions.

Injected Into Steel Negotiations—Although current two-year steel wage contracts provide they may be reopened this year only for discussion of wage adjustments, it is understood the United Steelworkers is pressing for consideration of pensions and welfare benefits. Legally, such demands are not permitted in the current negotiations, but the union apparently hopes to capitalize on the nuisance value of the demands.

There is little prospect that the Steelworkers will gain any early commitment on a welfare plan. The practical difficulties of working out the details of any welfare program would appear to preclude any substantial concessions at this time, even if the companies were inclined to grant them.

Companies Must Bargain — The NLRB found Inland Steel Co., Chicago, guilty of refusing to bargain with the United Steelworkers on pensions and ordered the company to discuss pension changes with the union, provided the union officers file noncommunist affidavits within 30 days.

The board held that pensions are a form of wages and that the terms under which the pensions are to be paid, such as retirement age, come within the meaning of "conditions of employment." The company, it held, must talk about pensions, if asked, and also the company cannot change existing pension plans without consulting the union.

Unless overthrown in the courts, to which the board's decision will be appealed by Inland Steel, the ruling brings the whole subject of pension or retirement plans into the scope of compulsory bargaining.

34 Million Man-Days Lost in 1947 Strikes

Man-days lost by strikes in 1947 were the third highest on record, exceeded only in 1946 and 1945. A total of 3693 work stoppages, effecting 2,170,000 workers, caused a loss of 34,600,000 man-days, according to the U. S. Department of Labor.

Greatest loss of time was in the strike of telephone workers involving about 370,000 workers and lasting 44 days.

Second largest loss was the industry-wide walkout of bituminous coal miners late in June, affecting 343,000 workers.

Denies Craft Elections in Steel Industry

ELECTIONS for separate bargaining units among bricklayers employed at two steel mills have been refused by the National Labor Relations Board. The elections, if they had been granted, would have been the first step toward the possible establishment of craft bargaining units in the steel industry where collective bargaining is now largely on a plant or company-wide basis.

The NLRB rejects the contention that the Taft-Hartley law requires it to hold a separate election among skilled craftsmen whenever such an election is requested by a craft union. The board holds the law still leaves the determination of such units to the discretion of the board.

The elections had been asked by the AFL Bricklayers Union, which was seeking to represent the bricklayers in the Middletown, O., plant of the American Rolling Mill Co. and the Lorain, O., plant of the National Tube Co.

Elections Opposed—Both the United Steelworkers of America-CIO, which represents the production employees along with the bricklayers of National Tube, and the Armco Employees Independent Federation Inc., which is bargaining agent at the American Rolling Mill's plant, joined the managements of the two companies in opposing the elections.

Some students of the labor movement predicted the Taft-Hartley law opened the way for balkanization of the large industrial labor unions. They believed the skilled workers in these unions would ask and probably be granted separate craft unions, which would bargain for their members apart from the production employees.

Such a move, it was believed, would permit the more highly skilled workers to protect their wage differential over the less skilled employees.

Law Not Mandatory—The board says that the Taft-Hartley law's provisions governing the establishment of separate craft unions permit the board considerable discretion. It holds the new law does not make mandatory for the board to carve craft units out of pre-existing industrial unions, but that it does preclude the board from denying separate bargaining rights to crafts solely on the basis of a prior board decision.

The board says that the two most important factors in denying the separate units for the bricklayers in the two steel plants are the close integration of their work with the whole steelmaking process and the long history of plant-wide bargaining in the steel industry.

Steel Product Shipments Ease Slightly in February

Pattern of steel product distribution in general showed little change last month compared with that of January and the year 1947. However, plates accounted for 10.7 per cent of the total in February compared with 9.8 per cent in January and 10 per cent in 1947 while hot-rolled bars accounted for 15.5 per cent compared with 14.7 per cent in January and 14.9 per cent in 1947. Hot-rolled carbon bar shipments increased to a percentage of 10.3 from 9.6 in January and 9.9 in 1947. Sheets accounted for a smaller percentage; hot-rolled sheets for 11.6 per cent against 12.6 per cent in January and 12.5 per cent in 1947, cold-rolled sheets for 9.7 per cent against 10.6 per cent in January and 8.7 per cent in 1947.

Total shipments eased slightly to 5,046,115 tons in February from 5,410,438 in January, according to the American Iron & Steel Institute.

Wean Equipment Names Officers, Directors

At a meeting of the stockholders of Wean Equipment Corp., Cleveland, Apr. 8, the following directors were elected: S. R. Wean, R. J. Wean Sr., R. J. Wean Jr., H. W. Lynn, D. A. McArthur, and J. R. Paisley. Officers elected were as follows: R. J. Wean Jr., president and treasurer; J. R. Paisley, vice president, general manager and assistant treasurer; G. J. Ridgway, secretary, and L. R. Connor, assistant secretary.

The company manufactures wire mill, narrow strip and fence machinery. It also is a manufacturer of machinery for Wean Engineering Co. Inc., Warren, O.

Present, Past and Pending

■ EXPANSIONS IN 1948 TO COST $18.7 BILLION
WASHINGTON—Joint survey by Commerce Department and Securities & Exchange Commission reveals American business, exclusive of agriculture, expects to spend $18.7 billion this year on new plants and equipment. This is an increase of more than 15 per cent over 1947 expenditures.

■ FEBRUARY STEEL EMPLOYMENT AT POSTWAR PEAK
NEW YORK—Iron and steel employment reached a postwar peak in February of 626,200 wage earners and salaried workers, American Iron & Steel Institute reports. Total industry payroll was $167.6 million and average hourly wage was $1.551.

■ SLOSS-SHEFFIELD ELEVATES EXECUTIVES
JERSEY CITY, N. J.—Hugh Morrow was elected chairman of Sloss-Sheffield Steel & Iron Co. and Claude S. Lawson was promoted from vice president to president at the company's annual meeting here.

■ OIC TOLD PLUMBING ADVISORY GROUP NEEDED
WASHINGTON—Makers of cast iron plumbing fixtures, meeting with Office of Industry Co-operation, have asked for formation of an industry advisory committee to help solve production problems. They say plant capacity is sufficient but more pig iron, coke, scrap and manpower are needed if 1948 housing program requirements are to be met.

■ SALE OF REPUBLIC SUBSIDIARY PENDS
CLEVELAND—Republic Steel Corp. is negotiating for sale of its wholly owned subsidiary, Republic Supply Co. of Houston, Tex. Prospective buyer of the oil field goods supplier has not been disclosed.

■ WHEELING STEEL TO INSTALL OXYGEN PLANT
NEW YORK—Arrangements have been completed for installation by Linde Air Products Co. of a large, low-purity oxygen plant at Wheeling Steel Corp.'s Steubenville, O., mill.

How Large an Air Force?

Defense chief estimates 70 group program, with proportioned increases in land and sea forces to make it fully effective, would raise military cost $18 billion

VASTNESS which the military preparedness program now being formulated may assume is indicated by estimates by Secretary of Defense Forrestal to the Senate Armed Services Committee on the cost of expanding the Air Force from a 55 to a 70 group program.

Mr. Forrestal believes an increase to 70 Air Force groups, with proportioned additions to the remainder of the military establishment, would cost $18 billion. The total military budget now under consideration is about $14 billion.

The defense chieftain made it clear that much of this expenditure would be required to bring the Army, Navy and merchant marine divisions up to balanced strength to complement the augmented Air Force.

He did not suggest "the creation at this time of such a costly military establishment" but said he did wish "to foreclose the possibility that I may come before you to request the full 70 air group program, with its essential concomitants, or some other or different program, based on continuing studies by the Joint Chiefs of Staff and reviewed by me."

Asked by President's Commission—First recommendation that the Air Force be increased to 70 groups came Jan. 1 from the President's Air Policy Commission. Two months later, the Joint Congressional Aviation Policy Board endorsed the recommendations for 70 air groups. (The term 70 air group program describes a complete program calling for 131 air groups, of which 70 would be regular Air Force, 27 National Guard, and 34 Air Reserve, and 22 regular Air Force squadrons. This means a total of 20,599 planes, of which 8158 would be in reserve. An air group may consist of 18 very heavy bombers, of the B-36 class; or 30 heavy bombers of the B-29 class; or 48 medium or light bombers; or about 75 fighter planes.)

Congressional proponents of greater air power last week appeared ready to increase the air army without proportionate increases in land and sea forces. This was in spite of the recommendations of Secretary Forrestal and the chiefs of the Army and Navy.

Washington observers expect the military budget figures to be a topic of debate in Congress for weeks to come, but practically all agree the trend in military expenditures will be upward.

Pet Plans Revived—Other government agencies are dusting off favored projects in hope they can get them approved as a part of the expanding military program. Plans are being readied to build up the merchant fleet, with emphasis on tankers and troop transports.

The Interior Department will seek more funds to work with the petroleum industry to insure an adequate supply of oil. The foreign aid plan coupled with the larger military establishment will place a heavier burden on the oil industry.

Office of Defense Transportation is pressing for more steel to build freight cars. ODT officials estimate a military emergency would catch the country short some 600,000 cars.

Department of Commerce continues to push for compulsory controls over materials. Should controls be made mandatory, it is considered likely the control administration might be built from the organization set up to administer the voluntary control program.

Disposal Moratorium—War Assets Administration has declared a 30-day moratorium on disposal of all unsold industrial plants, including machine tools and other production equipment, not covered by national security clauses. National security clause is a condition of sale contract which requires that a plant must be maintained in condition such that it can be reconverted to its original use on 120 days' notice.

Purpose of the moratorium is to permit the Munitions Board to review the status and condition of the remaining unsold plants with a view to imposing the restrictions of the national security clause on subsequent sales where appropriate.

Air Force enlargement is the topic of conversation here. Shown are, left to right: Secretary of Air W. Stuart Symington; Secretary of Defense James V. Forrestal; Sen. Chan Gurney, chairman of the Senate Armed Services Committee. Standing are Gen. Hoyt S. Vandenberg, left, who is succeeding Gen. Carl Spaatz, right, as chief of the Air Force.
NEA photo

Military Lend-Lease—Extension of military assistance and equipment to countries combatting Communist threats is gaining support. This probably would be called lend-lease, but actually would be outright grants of materiel, similar to those already made to Greece, Turkey and China. Much of such materiel would come from surplus now held by the military.

At the same time, the interdepartmental committee charged with determining what commodities come under the President's ban on shipments of "implements of war" to eastern Europe is encountering dif-

ficulties. Indications are the list will not be announced before the end of the month, if then. While there appears to be agreement that machine tools and production equipment which are required for making "implements of war" belong on the list, many such items find equal use in the production of civilian goods.

The administration wants to continue a fairly normal trade with Russia in order to keep manganese ore, chromite and some other items coming in from Russia. This may cause considerable compromise in setting up the list of banned products.

Stockpiling Activity Reports Exaggerated

WASHINGTON

Grave misconceptions as to the size and scope of the national stockpiling program are indicated by rumors originating in various parts of the country and referred to Washington for checking.

Within the past week, these rumors, all unfounded, were heard: 1. Munitions Board would start stockpiling 2,000,000 tons of copper; 2. 300,000,000 tons of rubber would be stocked; 3. unlimited tonnages of foreign iron ore would be brought in under the foreign aid program and stored at eastern seaboard points; 4. between $2 billion and $4 billion will be expended annually for stockpiling strategic materials.

These are typical rumors. There is no basis in fact for any of them. But on the strength of such stories, many people come to Washington in the hope they can get aboard the alleged stockpiling gravy train.

Actually the funds available for stockpiling are limited. The budget request for stockpiling in fiscal 1949 is $285 million, plus authority to make contracts involving $375 million. There is some support in Congress for a larger stockpiling appropriation, but there is as yet no certainty this will follow.

Some of the rumors are fantastic. Stockpiling of 2,000,000 tons of copper, at the present price of 21.5 cents a pound for electrolytic, would require $860 million, several times the total stockpiling budget requested for all materials. Also there is no place where that much copper could be bought for stockpiling; the metal is too badly needed for current consumption.

While details of the stockpiling program are not being revealed for reasons of security, this much can be said: Plans now are under consideration in connection with the foreign aid program to get more strategic minerals and metals in return for our goods and dollars. In fact, the indications are that priority powers under the Second Decontrol Act of 1947 will be invoked to get production of mining machinery required to get some foreign properties into production. Included in this program is copper.

Incidentally, 65 critical and strategic materials now are on the stockpiling list.

STEEL CAPACITY RISES

The American steel industry currently has 944 open-hearth furnaces, 29 bessemer converters and 217 electric furnaces with combined annual capacity of 94,233,460 net tons of ingots and steel for castings, the American Iron & Steel Institute reported last week. Capacity now is the largest in peacetime history. On Jan. 1, this year, there were 20 more open-hearth furnaces than on the like date a year ago. The number of bessemer converters and electric funaces was unchanged.

Blast furnace capacity this year totals 67,438,930 net tons with the number of stacks totaling 239. This compares with capacity of 65,709,200 net tons and 233 stacks last year.

Preparedness Seen Reviving Shipbuilding

REJUVENATED shipbuilding industry with an accompanying renewed appetite for steel was seen as increasingly likely when Secretary of the Navy John L. Sullivan recently told the House Merchant Marine Committee that President Truman will ask Congress for $100 million, or nearly three times the amount originally asked, for fiscal 1949 merchant ship construction.

Describing the program as an integral part of the national preparedness plan, Secretary Sullivan made no statement as to how much steel would be required, but an estimate of 1,400,000 tons to be consumed by 1951 seems conservative if the shipbuilding program is carried out as outlined by him.

To Boost Budget Requests—Mr. Sullivan disclosed that present budget requests of $29,500,000 for new ship construction, plus $10 million for betterment of existing ships, would be increased to $90 million for new ship construction during fiscal 1949, with $10 million remaining for ship improvement. He also indicated that the requested increase

(*Please turn to Page* 149)

Steel Ingot Production Statistics

	Estimated Production—All Companies								*Calculated weekly production all companies	Number of weeks in mo.
	—Open Hearth—		—Bessemer—		—Electric—		—Total—			
1947	*Net tons	Per cent of capac.	Net tons	Per cent of capac.	*Net tons	Per cent of capac.	*Net tons	Per cent of capac.	Net tons	
Jan. ...	6,544,841	95.1	384,096	87.7	284,309	65.9	7,213,246	93.0	1,628,272	4.43
Feb. ...	5,830,371	93.8	314,912	79.6	276,779	71.1	6,422,062	91.7	1,605,515	4.00
Mar. ...	6,614,369	96.1	378,893	86.5	314,224	72.9	7,307,486	94.3	1,649,545	4.43
1st qtr..	18,989,581	95.0	1,077,901	84.8	875,312	69.9	20,942,794	93.1	1,628,522	12.86
Apr. ...	6,360,600	95.4	375,675	88.6	306,422	73.4	7,042,697	93.8	1,641,654	4.29
May ...	6,634,716	96.4	372,878	85.2	321,903	74.6	7,329,497	94.5	1,654,514	4.43
June ...	6,312,674	94.7	351,247	82.8	304,744	73.0	6,968,665	92.8	1,624,397	4.29
2nd qtr..	19,307,990	95.5	1,099,800	85.5	933,069	73.7	21,340,859	93.7	1,640,343	13.01
1st 6 mos. ..	38,297,571	95.3	2,177,701	85.2	1,808,381	71.8	42,283,653	93.4	1,634,467	25.87
July ...	6,028,707	87.8	256,125	58.6	285,322	66.3	6,570,154	84.9	1,486,460	4.42
Aug. ...	6,324,456	91.9	346,033	79.0	311,597	72.2	6,982,086	90.1	1,576,092	4.43
Sept. ...	6,147,448	92.4	334,425	79.0	306,769	73.6	6,788,642	90.6	1,586,131	4.28
3rd qtr..	18,500,611	90.7	936,583	72.2	903,688	70.7	20,340,882	88.5	1,549,191	13.13
9 mos. ..	56,798,182	93.7	3,114,284	80.8	2,712,069	71.4	62,624,535	91.8	1,605,757	39.00
Oct. ...	6,826,543	99.2	384,272	87.8	349,520	81.0	7,560,335	97.5	1,706,622	4.43
Nov. ...	6,538,179	98.1	360,620	85.0	334,236	80.0	7,233,035	96.3	1,686,022	4.29
Dec. ...	6,649,666	96.8	373,367	85.5	343,043	79.7	7,366,076	95.2	1,666,533	4.42
4th qtr. .	20,014,388	98.0	1,118,259	86.1	1,026,799	80.3	22,159,446	96.4	1,686,411	13.14
2nd 6 mos. ..	38,514,999	94.4	2,054,842	79.1	1,930,487	75.5	42,500,328	92.5	1,617,827	26.27
Total ..	76,812,570	94.8	4,232,543	82.1	3,738,868	73.7	84,783,981	92.9	1,626,083	52.14
1948										
Jan. ...	6,768,497	95.5	343,169	77.5	361,110	79.0	7,472,776	93.6	1,686,857	4.43
*Feb. ..	6,245,344	94.3	340,596	82.3	354,270	82.9	6,940,210	93.0	1,676,379	4.14
†Mar. ..	6,842,289	96.6	363,235	82.0	407,100	89.0	7,612,624	95.3	1,718,425	4.43
†1st qtr.	19,856,130	95.5	1,047,000	80.6	1,122,480	83.6	22,025,610	94.0	1,694,278	13.00

* Revised. † Preliminary figures subject to revision.

For 1947, percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of Jan. 1, 1947, as follows: Open hearth 81,010,990 net tons, bessemer 5,154,000 net tons, electric 5,076,240 net tons, total 91,241,230 net tons.

For 1948, percentages of capacity operated are calculated on weekly capacities of 1,599,286 net tons open hearth, 99,962 net tons bessemer and 103,228 net tons electric ingots and steel for castings, total 1,802,476 net tons; based on annual capacities as of Jan. 1, 1948, as follows: Open hearth 83,610,690 net tons, bessemer 5,226,000 net tons, electric 5,396,770 net tons, total 94,233,460 net tons.

Zinc Flow Cut By Transport Difficulties

LARGE tonnages of zinc in producing districts abroad are immobilized by transportation difficulties.

Bottlenecks due to this factor are affecting adversely the movement of zinc from Australia, Burma, southwest Africa, Belgian Congo, and Argentina. However, total supply of zinc available for the non-Russian world is estimated at 1,625,000 tons a year, or about four and one-half times as much zinc as the maximum estimate for the Russian sphere. Available smelting capacity in Germany, Belgium, Australia and the United States might permit stepping up the "Western World" production to about 1,900,000 tons a year.

Meet at St. Louis — These were highlights of an address presented by S. D. Strauss, sales manager, American Smelting & Refining Co., at the 30th annual meeting of the American Zinc Institute Inc., in St. Louis, Apr. 15-16. A meeting of the Galvanizers Committee was held in conjunction with the institute's meeting and was attended by technical and operating men of the galvanizing division of the steel industry.

Other important addresses included those by: R. D. Stewart, manager, Steel & Asphalt Department, United Co-Operatives Inc., Alliance, O.; R. C. Todd, sales consultant, American Rolling Mill Co., Middletown, O.; R. A. Young, vice president, American Zinc Co. of Illinois, St. Louis; J. D. Conover, secretary, American Mining Congress, and Dr. James Boyd, director, Bureau of Mines, Washington; H. W. Steinkraus, president, Bridgeport Brass Co., Bridgeport, Conn.; Dr. C. L. Wilson, dean, School of Mines & Metallurgy, University of Missouri, Columbia, Mo.; R. J. Mechin, manager, Edwards Division, St. Joseph Lead Co., New York.

Mr. Strauss estimated that the annual amount of zinc available for consumption and stockpile in the United States is 810,000 short tons; in the western world outside the United States, 798,000 tons; and in the Russian bloc, about 296,000 tons.

Supply Breakdown — The United States supply was broken down as follows in short tons: From domestic ore and scrap, 570,000; from foreign ore, 300,000; imports of metal,

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Facts for Industry . . .

(As reported by government agencies)

Wrought Aluminum—February shipments of aluminum wrought products were off 3 per cent from January to 135,935,000 lb but were 10 per cent higher than February, 1947, shipments. Plate, sheet and strip accounted for 105,739,000 lb; rolled structural shapes, rod, bar and wire for 14,785,000 lb; extruded shapes, tube blooms and tubing for 14,303,000 lb; and powder, flake and paste for 1,108,000 lb. *Census Bureau, Commerce Dept.*

Mechanical Stokers — Factory sales of mechanical stokers in February totaled 4503 units, 58 per cent more than were sold in January and 81 per cent above February, 1947. Of the total 3660 were for residential use and 363 for small apartment houses and small commercial heating plants, to account for 89 per cent of total sales. *Census Bureau, Commerce Dept.*

Steel Boilers—February orders for steel boilers of 100 sq ft of heating surface and over totaled 1219 units with heating surface of 1.5 million sq ft. January orders were 1103 units with 1.1 million sq ft of heating surface. Of February's total 539, or 44 per cent, were stationary power boilers of over 15 lb pressure, 663, or 54 per cent, were steel heating boilers, and 17, or 1 per cent, were marine boilers. *Census Bureau, Commerce Dept.*

Latin-American Imports—Total imports into Latin America in 1948 are likely to be less than the estimated $6 billion of 1947, but value of imports this year will probably be as high as in any recent year except 1947. The U. S. supplied about 65 per cent of total Latin-American imports last year. *Office of International Trade, Commerce Dept.*

Brazilian Import Restrictions—Regulations governing prior licensing of all imports except pharmaceuticals, cement and certain foodstuffs, have been published by the Brazilian government. Brazilian exports are also covered. *Office of International Trade, Commerce Dept.*

U. S.'s Wartime Shipments—Value of goods and services furnished foreign countries from 1940 to 1945 was over $80 billion. Shipments from abroad during the period totaled $40 billion. "International Transactions of the United States During the War" describes trade, travel, income on investments, gold and capital movements, and government controls in international economic activity. Available from Superintendent of Documents, Government Printing Office, Washington 25, for 60 cents a copy. *Office of Business Economics, Commerce Dept.*

Alaskan Lead-Zinc Occurrence—Brief examination of lead-zinc occurrence at Berg Basin in southeastern Alaska was conducted in 1947 and continued examination is planned in 1948. Report and accompanying maps open for inspection at Geological Survey office, rooms 4217 and 1033, Federal Works Agency Bldg., Washington, and at Juneau and Fairbanks, Alaska. *Bureau of Mines, Interior Dept.*

Bad Debt Losses—Wholesalers' bad debt losses were 76 per cent higher in 1947 than in 1946, but were substantially below prewar. Loss rate in 1947 was $.07 per $100 of credit sales, compared with $.35 per $100 in 1937. *Census Bureau, Commerce Dept.*

Foreign Trade—U. S. imports in February were valued at $562 million, compared with $545.8 million in January. Exports totaled $1,086.4 million, compared with $1,090.7 in January. *Census Bureau, Commerce Dept.*

Rubber Consumption—Total U. S. consumption of new rubber was 86,085 long tons in February, compared with 101,177 in January. Included were 50,927 tons of natural rubber and 35,158 tons of chemical rubber. Reclaim consumption was 22,017 tons. Imports of natural rubber amounted to 54,268 long tons. Domestic production of chemical rubber and of reclaim were 29,025 tons and 24,992 tons, respectively. *Office of Materials Distribution, Commerce Dept.*

Machine Tool Men Look Ahead

Feeling permeates spring meeting of NMTBA that industry faces new, heavy responsibilities in connection with European recovery plan and national defense

CHICAGO — Nearly 400 executives, representing the majority of the 178 companies which constitute the membership of the National Machine Tool Builders' Association, attended the 46th spring meeting of that organization at the Drake Hotel, Chicago, Apr. 8 and 9. Permeating this entire meeting was a feeling that this industry now faces new and heavy responsibilities in connection with the European Recovery Program and the policy of stiffening America's industrial-military structure in order to back up this program.

It is prophetic of the swift strides now being made toward a radically changed economy, that Paul G. Hoffman, president of Studebaker Corp. and chairman of the Committee for Economic Development, who was to have been the principal speaker at the NMTBA banquet, had to cancel that engagement at the last minute because literally he has been "drafted" to head up the Economic Cooperation Administration which will carry out the Marshall Plan.

Raymond Moley, one-time assistant secretary of state and now associate editor, *Newsweek*, who was to have shared the banquet assignment with Mr. Hoffman, carried on alone.

War Not Inevitable—"Primarily," said Mr. Moley, "we are offering the European Recovery Program in order that countries which still are free shall not sink under the despair of Communism. We believe that we can succeed in that measure of resistance and that such effective resistance can be the way away from war. It is my conviction that war is not inevitable."

Shocking Possibility—A. G. Bryant, vice president, Cleereman Machine Tool Co., and president, Bryant Machinery & Engineering Co., pulled no punches in his keynote speech as president of the association. "It is a shocking possibility," he said, "that Russia—because of the newness of her industrial plants—may have an average age of machine tools far lower than ours.

"The most productive machines in the world were displayed at the big machine tool show in Chicago last September. However, those better machine tools can earn no profits until they are put to work in manufacturing plants."

The association recognizes constructive salesmanship as the primary force toward quick modernization of America's industrial plants, not only for domestic prosperity but also for national security in a troubled world. As a demonstration of such salesmanship, a committee of association members under leadership of M. A. Hollengreen, president, Landis Tool Co., lately has visited every presidential aspirant except Henry Wallace to make sure that they understand the importance of modern machine tools.

Tools In ERP Picture—Although overlooked in the initial Harriman Report, Mr. Hollengreen, who is chairman, Committee on Government Relations, assured the Chicago audience that they now are very much in the picture as far as the Marshall Plan is concerned.

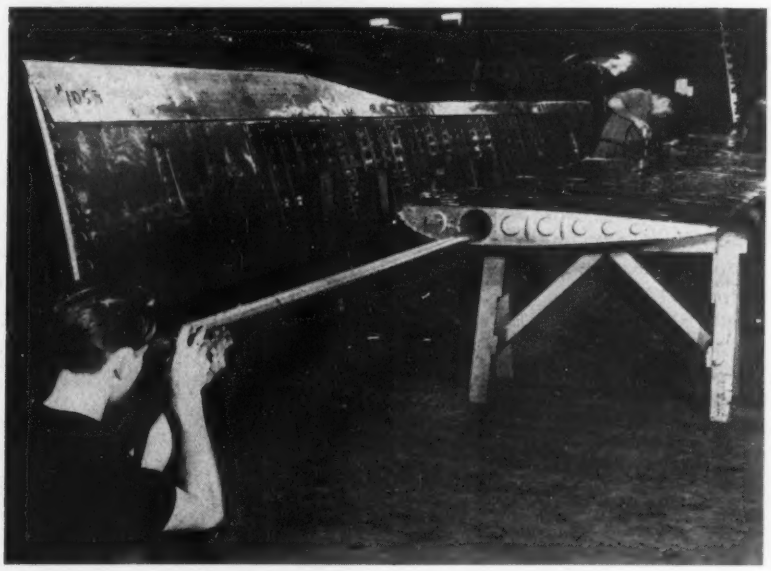
As a further demonstration of its active interest in constructive salesmanship, the association staged a panel discussion of selling and sales management.

Mr. Bryant served as moderator and the following were participants: D. R. Weedon, assistant manager, Blanchard Machine Co., and chairman of the association's Committee on Sales & Service; Bernard Lester, management consultant in sales engineering; H. L. Tigges, executive vice president, Baker Bros. Inc.; J. C. Herbert, sales manager, Jones & Lamson Machine Co.; D. M. Macconnel, president, Machinery Sales Co., and R. L. Giebel, president, Giebel Inc.

All these speakers stressed the need for a more scientific approach to machine tool selling.

Other speakers at this Chicago meeting included J. A. Raterman, president, Monarch Machine Tool Co., on the activities of the association's public relations committee toward better public understanding of production machinery as a force for good in the world; Arnold Brown, vice president, Brown & Sharpe Mfg. Co., on the need for clear recognition of 1948 costs in business; Vice Admiral George F. Hussey, USN (Ret.), on the work of the American Standards Association, which he now heads; Ray Ingram, vice president, Landis Tool Co., on the outlook in foreign markets; and W. V. Kelley, president, Machinery and Allied Products Institute, on the Washington and the world situation as it will affect the capital goods industries.

Tell Berna, general manager, National Machine Tool Builders' Association, struck a solemn note at the close of the meeting when he mentioned the possibility of early return to something like wartime controls as a result of the firm stand now being taken by the United States in backing up its belief in democracy and freedom.



MIRROR IN INDUSTRY: Fifteen-foot telescope is used to inspect rivets inside a wing flap tube at Boeing Aircraft Co., Seattle. Mirrors send reflection of rivet along tube, enabling inspectors to study it through a rifle scope on the telescope's end. NEA photo

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Studebaker's Paul G. Hoffman, in driver's seat as administrator of foreign assistance program, greatest promotional undertaking in history, faces tremendous task

AS ADMINISTRATOR for economic co-operation, under the new Foreign Assistance Act of 1948, Paul Gray Hoffman is in the driver's seat in probably the biggest promotional undertaking in the world's history—a concerted program to mend the sick economies of those European countries outside the iron curtain, and of China.

The authorized $6 billion for the first year's operation in the 4¼-year program represents only part of the story, for many additional billions will grow out of mutual assistance transactions between the participating nations. While the appropriation itself still is to be voted, the new organization can start immediately to spend up to $1 billion advanced from funds of the Reconstruction Finance Corp.

Mr. Hoffman already has brought in as consulting assistants three men whom he regards as "three of the best economists in the country." They are: Dr. Calvin B. Hoover, professor at Duke University, who served as postwar economic adviser to the Allied Control Council in Germany. He served with the Office of Strategic Services during the war and aided in the work of the President's Committee on Foreign Aid (Harriman Committee), of which Mr. Hoffman was a member; Richard Bissell who was executive secretary of the Harriman Committee and largely the author of its final 3-part report. Before that he had served with the Office of War Mobilization and Reconversion; and Dr. Edward S. Mason of Harvard University, who was chief economic adviser at the Moscow Foreign Ministers' Conference in 1947.

Signed Agreements — Before the full program can become effective, the secretary of state must obtain signed agreements with each participating nation. These will specify nature of the needed assistance, the terms under which it will be furnished, and the specific uses to which it will be put. The agreements will state what kinds and amounts of co-operation the participating nations will give each other. They will provide for currency stabilization, details of exchange. They will also cover contracts, largely on a barter trade basis, under which strategic and critical minerals and metals will be shipped to the United States for consumption or stockpiling. These agreements, the act states, should be executed as far as possible, by June 30, 1948.

In the meantime, certain kinds of assistance will start immediately—or rather, there will be no interruption of the assistance program already in operation under statutes previously enacted.

Has Vast Powers—The act gives vast powers to Mr. Hoffman—and to enable him to utilize them effectively it has given him cabinet status.

He may procure any commodity, from any source at home or abroad. He may open charge accounts with manufacturers or other suppliers. He may furnish technical assistance where needed to further the program. The act goes into multitudinous details—as authorizing the administrator to "process, store, transport, and repair any commodity, or perform other services with respect to participating countries." Of interest to industry is a provision under which the administrator is required to "facilitate and maximize the use of private channels of trade in carrying out the purposes of the act." In addition, Mr. Hoffman has power to provide guarantees against losses incurred by individuals or corporations doing business under the foreign assistance program.

PAUL G. HOFFMAN

Studebaker Corp.'s president, who has resigned to become director of the European Recovery Program. NEA photo

While the powers of the administrator thus are comprehensive, there is one power in which he is lacking—and that is the power to determine how much of any commodity may be exported under the foreign assistance program. Under existing statutes, and executive orders, Secretary of Commerce Harriman continues to have the responsibility of determining the limit to which key commodities can be shipped out of the country without impairing the home economy.

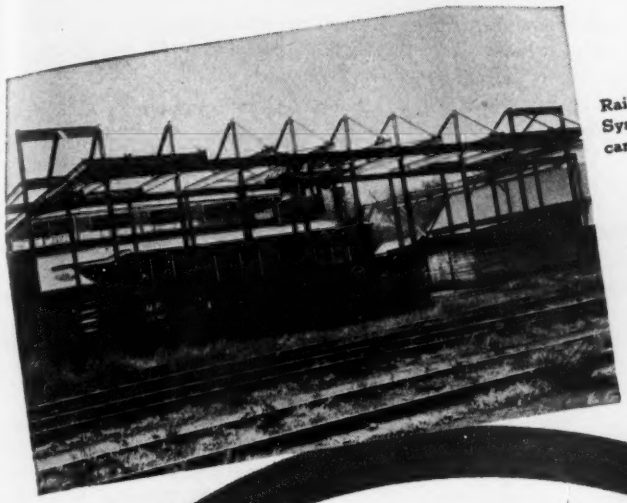
Harriman Decides Exports — Just as before, Mr. Harriman is the top man in deciding what products of the metal producing and fabricating industries may be exported —finished rolled steel and nonferrous metal products, machine tools, and all sorts of industrial materials and equipment.

Mr. Harriman has still another power which is of extreme importance in the foreign assistance picture —the power to grant priorities in order to facilitate the program. This power, in the Second Decontrol Act of 1947 (Public Law 188), is due to expire May 31, but so important is its continuance regarded that Mr. Harriman is about to request Congress for an extension. This will undoubtedly be granted, since the use of this power may be necessary to carry out the purposes of the Foreign Assistance Act.

The power of issuing priorities may be exercised under two circumstances: 1—To permit the manufacture of equipment needed abroad for the production of materials urgently needed in the United States, and 2—to permit the manufacture of equipment whose exportation is certified by the secretary of state as necessary in the interest of United States foreign policy.

To Request Extension—An extension of this power to issue priorities to permit the manufacture of machinery for export will be requested on the ground that it may be necessary in order to enable us to get larger quantities of needed materials from abroad.

Commerce officials also would like to be in a continuing position to in-



RailMaster 5-Ton MonoRail System saves 31 hours for each car unloaded at this plant.

One man now unloads a car in 5 hours where formerly 3 men took 36 hours.

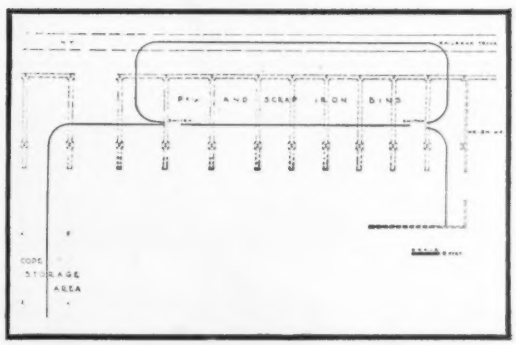
Handling Costs Reduced 86% with AMERICAN MONORAIL

American MonoRail System also used for storing copes and breaking scrap with 1000 lb. steel ball.

At this plant it formerly took 3 men appoximately 36 hours to unload and store a car of pig or scrap iron. With the American MonoRail system one man now accomplishes the same job in 5 hours.

The savings in time is just part of the story since the system is used for breaking scrap as well as storing copes.

American MonoRail engineers often prove marked reduction in handling costs. They have hundreds of cases from which to draw. A consultation can be quickly arranged.



SEND FOR BULLETIN C-1. A 56-page book showing successful applications of American MonoRail Systems.

THE AMERICAN MONORAIL COMPANY

13102 ATHENS AVENUE **CLEVELAND 7, OHIO**

voke this priority power in order to obtain production of other machinery and equipment to be exported under the act.

Efforts of manufacturers' representatives in Washington to get accurate information about the size and variety of purchases to be made in the United States under the foreign assistance program so far have brought out rather indefinite expressions. That is because of new factors which have entered the picture; these must be evaluated before any close estimates will be possible.

Better Understanding—First and foremost, there will have to be a better understanding as to how much of an impact on the domestic economy will result from the step-up now beginning to be reflected in our production of war material. Administration brass hats met at the White House Apr. 7 to consider a preliminary report on this subject by the President's Council of Economic Advisers. Some difficulty was encountered by the council in translating new military requirements in terms of materials, machinery and manhours. Furthermore, only a part of the ground could be covered in that report, since much of the step-up in military production still is in the blueprint stage. An example is the 70-group Air Force program now under debate in Congress. Just how impossible it is right now to make allowance for all military potentials is indicated by the testimony of Secretary Forrestal that such an increase in the Air Force might require an outlay of $18 billion—over and above all appropriations requested to date—in order to create all the additional services necessary to make effective use of such an expanded air fleet.

Second, European needs have undergone some change since last fall and it will be necessary to make a new tabulation of needs for each country. Even prior to the appointment of Mr. Hoffman, a nucleus organization in the State Department had sent out a monster questionnaire to each of the participating nations with a view to permitting a revised tabulation of needs. But even this tabulation—which it is hoped to have in shape before the end of April—will not be the last word.

Steel Exports—For example, when Commerce Department is questioned as to how much steel will be exported after the foreign assistance program becomes operative, it replies that there may be some redistribution of the steel we ship abroad, and there may be slight changes in the way of substituting one steel product for another—but that total exports will not be larger than in 1947, and chances are they will be less. In other words, exports will be 6,500,000 tons annually or less.

Several angles are involved in reaching this conclusion. First, we will need more steel at home and can spare less for export. Second, the secretary of state is instructed by the Foreign Assistance Act to put an end, if possible, to dismantling of German plants whose output is needed to promote European recovery. Under this provision, it is hoped, expanded steel production in Germany can be arranged, and that would take a lot of the potential European load off our shoulders.

Still another factor whose impact on the domestic economy cannot yet be measured is the plan for an early revival of lend-lease military assistance to our potential allies in the event of war.

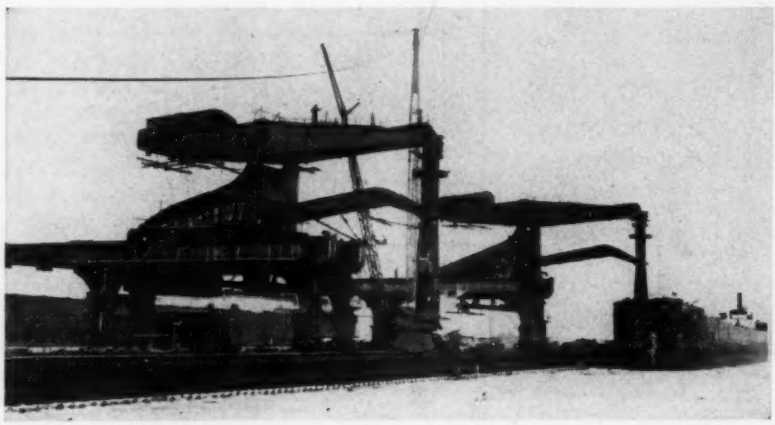
Public Advisory Board—Mr. Hoffman is to proceed with the guidance of a Public Advisory Board to be appointed by the President of outstanding citizens. Under the act, he also is a member of the top National Advisory Council on International Monetary & Financial Problems. He will be under the constant scrutiny of a new congressional "watchdog" committee, the Joint Committee on Foreign Economic Co-operation.

Assisting him will be a deputy administrator who will also serve as acting administrator in his absence. This deputy is to receive a salary of $17,500 as compared with $20,000 for Mr. Hoffman. Mr. Hoffman also will have a United States Special Representative in Europe with status of "ambassador extraordinary and plenipotentiary," subject to assignments by both Mr. Hoffman and the President. Mr. Hoffman also will select chiefs of special missions to be sent to each participating country to take care of matters coming under the assistance program.

In his procurement policies, Mr. Hoffman has only two statutory curbs. Both are aimed at undue draining of vital United States supplies. One limits the quantity of wheat that may be converted into flour for the assistance program. The other instructs him to procure petroleum to the maximum extent from foreign sources.

The act provides Mr. Hoffman with welcome relief from the salary limits which often make it difficult to entice good men into government service. It gives him authority, and also the various departments and agencies that have assignments under the act, to employ up to 100 men at salaries beyond the usual government scale, and 25 of these may be paid from $10,000 to $15,000 per year. In addition, any required number of consultants may be retained on a basis of $50 per day, plus traveling expenses plus $10 per day living expenses. Mr. Hoffman, on taking over his new duties, was handed a list of 250 "specialists" that was prepared by government personnel men. A lot of these will be taken on, but in addition Mr. Hoffman will want a lot of people from business and industry. He is expected to fill many of the key posts with the assistance of fellow members of the Committee for Economic Development and of the Business Advisory Council of the Department of Commerce.

Mr. Hoffman's office is in the new Malatico Bldg. at Connecticut avenue and H street N. W.



NEW DOCK FACILITIES AT TOLEDO: Each of the two ore unloaders which will serve the new coal and ore dock at Toledo this season is capable of unloading ore at a rate of 30 tons a minute. The dock will be opened by the Baltimore & Ohio and the New York Central railroads June 2

Steel Quotas To Pinch Some British Users

BIRMINGHAM, ENG.

INCREASING DIFFICULTY in obtaining sufficient steel is foreseen this quarter by those British industries not favored with high priorities. Under the new allocation system put into effect Apr. 1, the more essential groups of steel users are to get all the steel promised them, instead of a fraction of quotas which has happened frequently in the past.

To start this program off, iron and steel producers cancelled all undelivered orders at the end of first quarter. Favored industries are now able to renew these orders, but other consumers face reduced operations or complete shutdowns, depending upon the amount of non-allocated steel available.

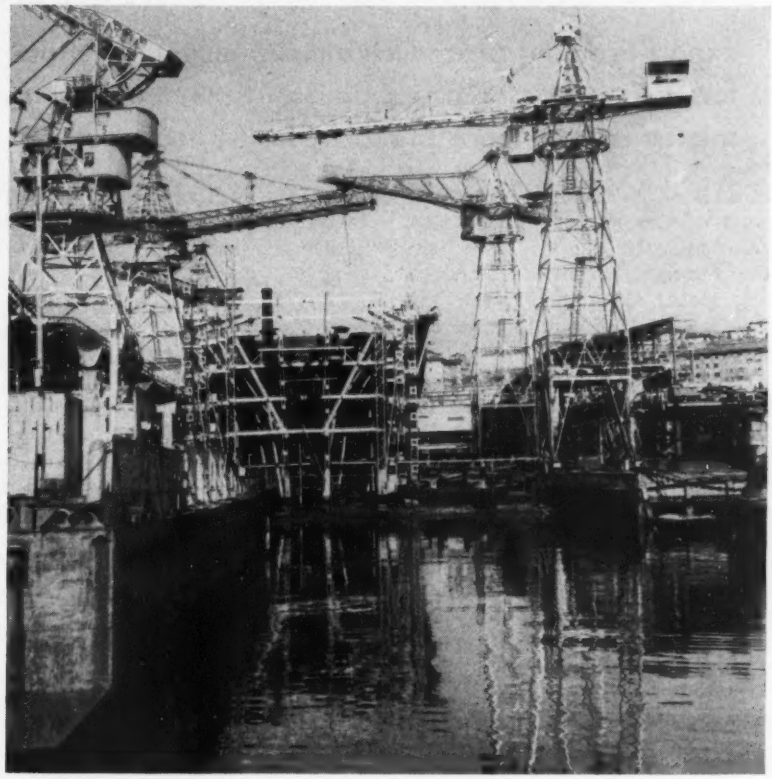
Industries which are expected to receive substantial quantities of iron and steel for expansion and rehabilitation programs include coal mining, agricultural machinery and the recently nationalized electric power. This latter industry, taken over by the government Apr. 1, now will be enlarged and equipped with more powerful generating equipment. This process, however, will be slow and the shortage of electric energy is expected to last for a number of years.

Estimates of March steel production indicate it was as good as that for February, when on a yearly basis a new record was established. Coal no longer causes anxiety in the trade, and the current drive for steel scrap is meeting with considerable success. Despite the improvement in scrap flow, present high steel production is still eating into stocks, which at some works are dangerously low. Negotiations are under way to increase deliveries of German scrap, but quotations are high compared with domestic material.

Semifinished Is Bottleneck—Despite larger ingot production, supply of semifinished for rerolling facilities continues tight, particularly in billets and sheet bars. The shortage still forces occasional finishing mill shutdowns, and reductions in the number of shifts are common.

Demand for sheets is unabating, particularly from the automotive industry. The sheet shortage among these users is of extreme concern because of the large export goal of this group.

Before the war substantial quantities of semifinished were imported and large-scale resumption of this trade would be welcomed. Some improvement is expected, however, as the result of a recently signed agreement with Belgium, providing for larger volume of billet and sheet bar imports.



SHIPYARD IS SORE SPOT: The San Marco shipyard outside Trieste is one of the few industries of that area which has continued work at near the prewar level. Three ships are being built there now for Scandinavian countries. Most of the workers are members of a Communist-controlled union and the shipyard has been a continuous sore spot in Trieste's administration. NEA photo

Pig Iron Output Gains—A steady rise in pig iron production has been possible in the last few months. Coke supplies have improved and considerable quantities of imported iron ore have been delivered. Foundry iron continues scarce, however, and despite severe curtailment of house building and the consequent drop in demand for light castings, foundrymen are working with extremely limited stocks. Export demand for castings as such or in other manufactures swells demand for iron.

Iron and steel exports in February fell to the lowest total since the end of 1945, at 128,109 tons. This was 17 per cent below average exports in fourth quarter, 1947. Imports in February were 26,729 tons.

France

Increased allocation of furnace coke this year is expected to enable France's iron and steel industry to blow in an additional 15 to 20 blast furnaces. Output will be increased by about 25 per cent as a result and volume of exports will be correspondingly raised. Negotiations are now in progress for the first postwar delivery of French semifinished steel to Great Britain.

Output of iron ore last year was 18,697,000 metric tons, of which 17,572,000 tons were from the Lorraine district. Last year's production compared with 16,215,000 tons in 1946 and 33,176,000 tons in 1938. Stocks at the end of 1947 were 8,265,194 tons, corresponding to five months' output. Exports in 1947 were 6,302,961 tons, going mostly to Belgium and Luxemburg. Exports in 1946 were 5,488,558 tons.

Poland

Work has started on a new iron and steel works at Nowa Huta, the plant to include coke ovens, blast furnaces, open hearths and necessary power facilities.

It is estimated that when completed the works will have a capacity larger than the entire present Polish output. Part of the plant and machinery will be supplied by Russia.

Quotas Help in Channeling Aid

Export licensing procedure aims at making best use of foreign countries' dollar supplies. Second quarter steel quotas include more products, larger tonnages

EXPORTS of American products to the rest of the world assumed new prominence with passage into law of the Foreign Assistance Act, involving global aid and providing for expenditure of $6,098 million in the next 12 months.

As part of the implementation of this overall program, aimed at enabling the United States to aid other countries in their efforts to rehabilitate industry and to stabilize their economies, on Mar. 1 new licensing procedure requiring individual export licenses was placed in effect.

Basic reason for such government direction over exports has been given by Commerce Department officials as the widespread dollar shortage in other countries. Although all countries to greater or lesser degree have had import limitations, which have been tightened repeatedly in the effort to prevent squandering dollars for goods nonessential to those governments' economies, the need has grown for more effective ways to channel the right American-made goods to the right countries at the right time. This kind of government direction is regarded as necessary until economies and governments are stabilized to the point where normal international trade can function.

To determine the various countries' requirements, consultations between the U. S. and other governments take place. On the basis of indicated foreign requirements and ability of U. S. industry to supply the needed products and of the U. S. economy to spare them, export licenses are being issued.

Quarterly export quotas set up by the Office of International Trade, Department of Commerce, play an important role in the control scheme. These quotas indicate the volume of exports of specific products the government considers necessary to help rebuild and re-equip the world's production machine, and in the interim to sustain life.

Steel Quotas—To iron and steel producers and to ferrous metal consumers the export quotas for steel mill products are of particular interest. OIT's second quarter, 1948, quotas show a substantial overall increase over the quotas set up for first quarter (STEEL, Feb. 16, p. 65; and Mar. 22, pp. 46, 47). The listing by groups of iron and steel products contains 45 product classifications, compared with 28 in the earlier listing. Tonnages in many of these categories are increased.

Boiler and other carbon plate quotas involve the largest tonnage in second quarter at 107,000 short tons, compared with 111,600 in first quarter. A total of 100,200 short tons of hot-rolled carbon steel bars may be licensed, compared with 40,000 in first quarter. Sheet and strip tonnage quota is moderately above first quarter aggregate. Allowable exports of structurals show substantial increases in the current period. Tonnage quotas are itemized in the table on page 55.

Before enactment of the European aid measure and the new licensing regulations, volume of American exports was showing a declining trend, occasioned by foreign moves in the latter part of last year to reduce the dollar drain through drastic import restrictions. American imports throughout the period showed an inclination to rise, as foreign countries spurred their export activities to bolster dwindling dollar supply.

Steel Shipments—Apparent in the latest figures on iron and steel exports, for January, was a curtailment in American shipments. Department of Commerce reports total exports of iron and steel finished and semifinished products dropped to 500,767 net tons in that month. This total compares with 558,735 net tons in December and a monthly average last year of 549,274 net tons.

As in the previous month, largest tonnage exported was of tin plate and tagger's tin, 55,168 net tons

U.S. EXPORTS OF IRON AND STEEL—JANUARY

(Net Tons)

	December 1947	Year 1947	January 1948
Semi-Finished and Finished Products:			
Ingots, blooms, billets, slabs, sheet bars	36,394	490,765	41,590
Wire rods	6,137	71,237	4,834
Skelp	3,338	67,403	5,969
Iron bars	453	34,755	1,032
Concrete reinforcement bars	17,469	248,205	13,924
Steel bars, cold finished	8,350	106,301	6,899
Other steel bars (excluding alloy)	37,948	535,421	39,797
Alloy steel bars	16,226	207,999	14,270
Welding rods, electric	1,724	14,844	945
Boiler plate	1,221	32,560	2,361
Other plates, not fab.	31,282	530,265	37,002
Plates, fab., punched or shaped	4,056	37,231	2,208
Iron sheets, black	1,574	30,216	1,828
Steel sheets, black	50,535	568,867	42,308
Galvanized sheets	5,172	74,603	4,396
Strip steel, cold rolled	7,643	89,621	6,587
Strip steel, hot rolled	8,398	106,850	7,346
Tin plate and tagger's tin	67,779	609,509	55,168
Terne plate (incl. long ternes)	1,523	12,851	646
Structural shapes, fab.	51,949	754,182	29,813
Structural shapes, plain			17,347
Frames and sashes	7,782	42,830	176
Sheet piling			5,112
Rails, 60 lbs. per yard and over	57,630	500,584	42,445
Rails, less than 60 lbs. per yard			752
Rails, relaying			5,950
Splice bars and tie plates	12,665	157,820	13,085
Frogs and switches			1,220
Railroad spikes			1,163
Railroad bolts, nuts, and washers			787
Car wheels, tires and axles	4,784	88,646	3,702
Seamless black pipe	1,658	18,723	1,419
Seamless casing and oil line pipe	41,124	333,498	14,307
Seamless boiler tubes	7,958	69,955	4,526
Welded black pipe	5,235	91,133	5,227
Welded galvanized pipe	5,705	70,221	3,821
Welded casing and oil line pipe	*	*	12,916
Welded boiler tubes	*	*	123
Other pipe and fittings	9,003	101,853	6,564
Plain wire	8,018	84,382	6,572
Galvanized wire	10,102	101,026	7,830
Barbed wire	8,839	78,864	7,251
Woven wire fencing	1,037	12,378	1,300
Woven wire screen cloth	590	5,986	477
Wire rope and strand	1,049	30,785	1,128
Wire nails	1,719	25,755	1,794
Other wire and manufactures	4,543	52,068	5,182
Horseshoe nails	1,875	15,995	89
Tacks			347
Other nails, incl. staples			1,191
Bolts, nuts, rivets and washers, except railroad	4,674	48,325	5,489
Forgings	3,558	35,870	2,515
Horseshoes	16	900	37
TOTAL	558,735	6,591,282	500,767

* Included with seamless.
Source: United States Department of Commerce.

having been shipped in January. Second place tonnage again was rails, aggregating 49,147 net tons. Structural shapes retained third place with a total of 47,160 net tons and black steel sheets ranked fourth again with 42,308 net tons. Detailed statistics are shown in the table at left.

Imports, Exports—Total U. S. exports declined further in February, being off to $1,086.4 million from $1,090.7 in January. Imports were $582 million, up 7 per cent from January's $545.8 million and 22 per cent above the 1947 monthly average.

Of the total February export valuation, about one-third consisted of machinery and vehicles, which aggregated $327.3 million; metals and their manufactures exported during the month were valued at $103.5 million, and nonmetallic minerals at $101.2 million.

Metals and manufactures, except machinery and vehicles, accounted for $58.6 million of February's import valuation. Imported nonmetallic minerals were worth $52.9 million, and machinery and vehicles $10.2 million.

Canada Steel Co. Plans $13,450,000 Expansion

Steel Co. of Canada Ltd., Hamilton, Ont., estimates its expenditures on capital account for 1948 will be approximately $13,450,000. Similar expenditures last year were about $6,200,000.

In the ten-year period, 1938-1947, gross plant value was doubled by the expenditure of $46,060,000 on new facilities and equipment. During the present year the company plans to modernize existing blast furnaces and to make provision for installation of another blast furnace. Still under construction at the end of 1947 were mills and auxiliary equipment for the production of cold-reduced, light gage sheets and tin plate; electrolytic tinning machinery; a new boiler house and an office building. During the year a new battery of 61 by-product coke ovens was placed in operation.

Thomas Steel Expansion Costs $885,820 in 1947

Thomas Steel Co., Warren, O., spent $885,820 on new plant additions and equipment in 1947 and further improvement and replacement projects are being considered, according to C. H. Lewis, chairman, and E. M. Barber, president, in their annual report for the company.

The company is considering new products, and since 1946 has already placed some on the market, including special finish steel for appliance manufacturers, tempered spring steel in a broader range of width and thickness and special coated steels.

EXPORT QUOTAS—SECOND QUARTER 1948

(Short Tons)

Steel ingots, blooms, billets, slabs, sheet bars, tin-plate bars (iron made in steel-making furnaces included):	
Containing no alloy:	
Steel ingots	15,000
Steel billets, blooms, and slabs	55,000
Steel sheet bars, and tin-plate bars	750
Alloy steel (stainless included):	
Steel ingots	1,000
Steel billets, blooms, and slabs	25,000
Steel bars, cold finished, including nonalloy and alloy, except stainless	16,900
Concrete reinforcing bars	44,000
Iron bars; Other steel bars and rods (hot-rolled), containing no alloy	*100,200
Other steel bars and rods (hot-rolled), alloy steel, except stainless	30,000
Wire rods, except specialty steel	10,000
Boiler plate; Other plates, except fabricated (hot and cold rolled included) containing no alloy	107,000
Other plates, except fabricated (hot and cold rolled included) alloy steel, except stainless	5,000
Skelp iron and steel	500
Iron sheets, galvanized; Steel sheets, galvanized	†18,500
Steel sheets, black ungalvanized (hot and cold-rolled included) containing no alloy; Iron sheets, black	78,500
Steel sheets, black, ungalvanized (hot and cold-rolled included) alloy except stainless	10,000
Iron and steel strip, cold-rolled, containing no alloy; Iron and steel hoop, band, and scroll, cold-rolled, containing no alloy	13,000
Iron and steel strip, hot-rolled, containing no alloy; Iron and steel hoop, band, and scroll, hot-rolled, containing no alloy	12,500
Terneplate, including long ternes	1,500
Structural shapes, except fabricated	59,000
Structural shapes, fabricated except prefabricated houses	54,000
Plates, fabricated, punched or shaped	6,200
Sheet piling	13,000
Rails, under 60 pounds per yard	6,200
Relaying rails	9,000
Rail joints, splice bars, fish plates and tie plates	22,000
Boiler tubes, iron and steel:	
Seamless; Welded	10,000
Malleable iron screwed pipe fittings, 150-lb. pressure and under; Floor drains, cast iron; and the following iron and steel pipe fittings when 150 lbs pressure and under: couplings; galvanized pipe fittings; malleable iron pipe fittings; pipe joints, grey iron, extension; pipe nipples, lap-welded, black; pipe plugs; pipe unions; screw elbows; swage nipples	4,800
Cast-iron pressure pipe; Cast-iron pressure pipe fittings	9,000
Welded black pipe, wrought iron; Welded galvanized pipe, wrought iron	1,700
Welded galvanized pipe, steel	14,000
Iron and steel pipe, n.e.s.	16,000
Iron and steel wire, uncoated	19,000
Galvanized wire	18,000
Barbed wire	13,000
Woven-wire fencing	2,900
Wire cable and rope, except insulated	3,600
Baling wire, black, annealed; coils, cold finished; musical instrument wire; piano wire; spring wire, bright steel, for musical instruments	2,000
Wire nails; Nails, asbestos shingle; cut; roofing, lead-headed; shingle; siding, zinc coated; smooth, flat head, cement-coated	5,700
Castings and forgings, iron and steel:	
Railway car wheels, except locomotive; Railway car axles, without wheels, except locomotive; Railway car axles, fitted with wheels, except locomotive	6,000
Iron and steel forgings, n.e.s. (except railway car wheels, tires, and axles, and horseshoes and mule shoes):	
Containing no alloy	3,700
Alloy steel (stainless included)	3,000

* No more than 40 per cent of the quota will be licensed for steel bars and rods (hot-rolled) containing no alloy.

† No more than 25 per cent of the quota will be licensed for gages 22 and lighter.

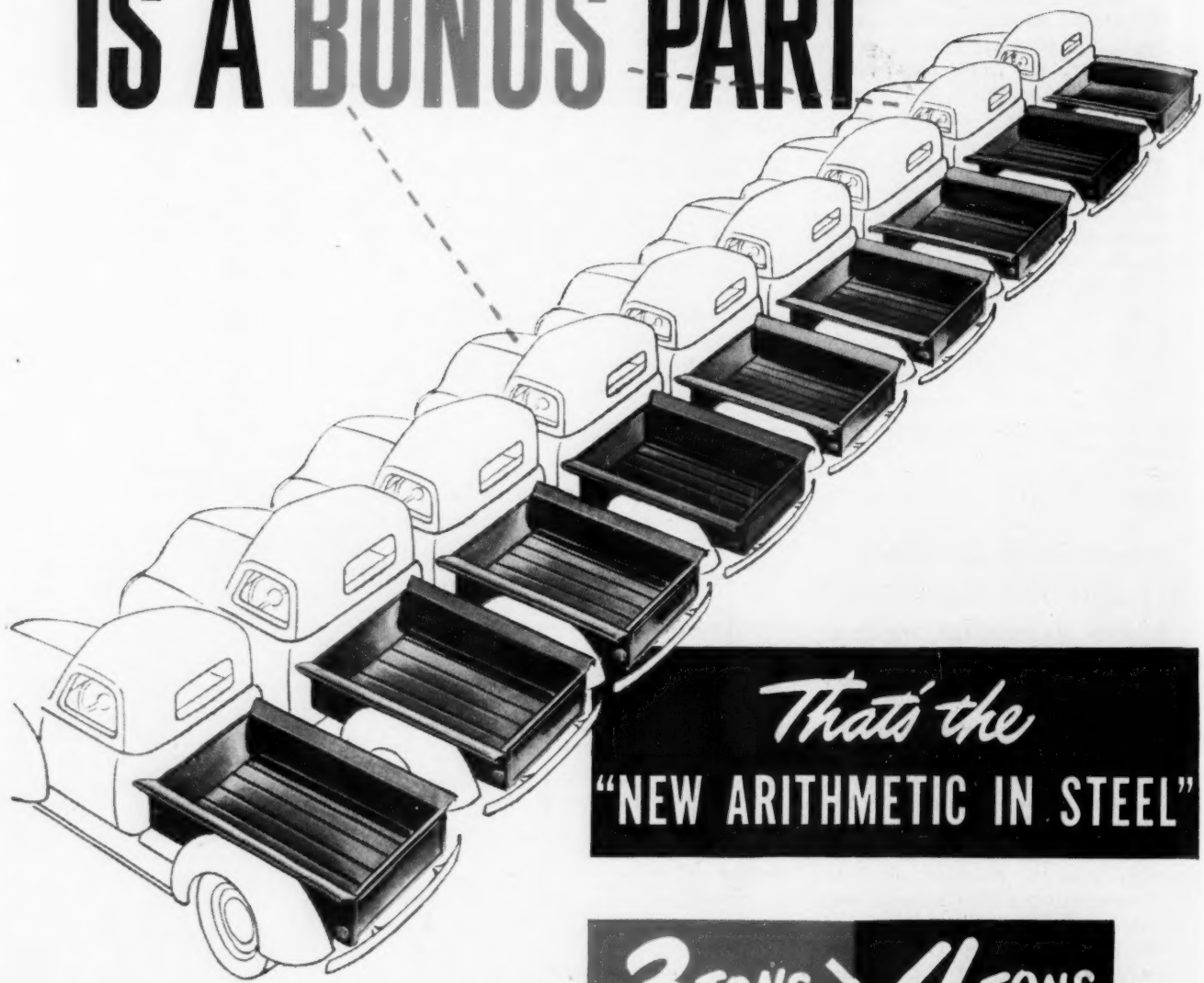
Budd Backlog at End of 1947 Tops $148 Million

Budd Co., Philadelphia, had unfilled orders amounting to $148,466,000 at the end of 1947.

Included in this backlog were orders totaling $85,610,000 for automotive products, $59,339,000 for railway cars and $3,497,000 for agricultural equipment. "Operating results of the automobile division," according to Edward G. Budd Jr., president, "were good, being limited only by the amount of steel available. The railway car business was not profitable last year. Unrecoverable costs on cars under construction were charged to operations."

Earnings of the company for 1947 were $4,086,253, compared with a loss of $3,979,536 for 1946.

EVERY FOURTH PART IS A BONUS PART



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By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Only one newcomer to automotive industry has yet produced postwar cars in volume. Others find plants, equipment and materials tough hurdles, but plans go forward

DETROIT

NEWCOMERS to the automobile manufacturing industry in the postwar period, with the exception of Kaiser-Frazer, so far have confined their activities largely to publicity, an unfortunate happenstance for the reason that in the past 2½ years the market for motor vehicles has been wide open and buyers would go for just about anything on wheels. The trouble is that it takes time and plenty of money to start even a modest car-building enterprise. Plants, equipment and materials are tough hurdles to clear, sales are incidental.

Kaiser-Frazer has peddled about $54 million in securities to the public and has dipped into the treasury of the Bank of America for another $15 million in the form of a loan. Still, operations thus far have done little better than break even, while field stocks of cars in certain spots are excessive. Until they are liquidated there is little point to developing a lower-priced model or even changing the present models to any degree. If it were possible economically to close the plant down for a month until all dealers could clear out their inventories, a fresh start might be feasible, but this does not appear in the cards at the present time.

A sharp battle seems to be shaping up between Kaiser-Frazer and Cyrus Eaton of Otis & Co. over the recent stock issue which died aborning. K-F has brought suit against the financial firm for withdrawing from the underwriting; meanwhile Eaton has hinted that the purpose of the stock issue was not to increase production facilities but to pay off bank loans. This much may be inferred: A company of the stature of Otis & Co. is not one to welsh on a deal just for the hell of it, so something must have looked fishy to them in the K-F stock issue. On the other hand, practically every dime of the Kaiser interests is pledged against the Willow Run operation, so they are going to battle tooth and nail. Meanwhile plans are being drawn up for some new form of financing, under the guidance of First Boston Corp., itself no slouch in the financial world.

Production Scaled Back

K-F has scaled back production to around 600 cars a day, in contrast with the pace of 1000 or better a day prevailing at the turn of the year. This has meant a complete reshuffling of procurement schedules. The foundry at Dowagiac, Mich., for example, has been down for an extended period, and Wilson Foundry & Machine Co. at Pontiac has held up production for the K-F account during the readjustment. The Dowagiac foundry has insisted on continuing shipments of coke and it now develops the fuel was reconsigned to a foundry in Cleveland producing castings for Kaiser-Frazer.

K-F has been up to its ears in bartering and swapping materials for the past couple of years. Several hundred thousand dollars worth of tools and dies, originally purchased for production of the front-drive Kaiser and subsequently scrapped, were disposed of without loss by tieing them in to sales of sheet steel which the company had available. Likewise, surplus quantities of aluminum and galvanized steel were peddled on a similar basis. The galvanized material originated from another tie-in sale from the Newport, Ky., rolling mill of International Detrola Corp., which furnished K-F some hot-rolled sheets.

The activities of International Detrola in the steel marketing picture make story-book reading, although little has leaked out except for disclosures at a recent Washington congressional committee hearing. Gist of the hearings was that the company received more than $8 million in noninterest-bearing loans from automobile and parts manufacturers in exchange for promises of steel. On another deal, a steel-buying syndicate had to take $825,000 worth of radios along with a steel tonnage, the radios being sold at a loss of better than half a million, but the price of the steel being boosted $100 a ton or more so that the loss on the radios was more than wiped out.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,277	366,205
February	399,452	393,636
March	515,223*	443,588
April	.....	445,137
May	.....	404,191
June	.....	421,466
July	.....	400,944
August	.....	364,478
September	.....	444,501
October	.....	461,536
November	.....	417,493
December	.....	492,109
12 mos.	.....	5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
Mar. 27	107,284	100,355
April 3	105,132	97,385
April 10	102,950	97,893
April 17	100,000	105,337

Estimates by Ward's Automotive Reports

Allure Is Powerful

With all the headaches that Kaiser-Frazer has experienced, it is a wonder that other entrepreneurs would even bother to launch automobile manufacturing projects. However, they have been and still are; the allure is too powerful to resist. The one closest to realization, of course, is Tucker Corp. in Chicago, which has rounded up about $15 million in capital through sale of dealer franchises and securities. No cars have been built yet, but a recent meeting of stockholders at the Chicago plant was shown a demonstration model which appeared to run satisfactorily in both directions, although the engine compartment was locked tight.

Among the several hundred assorted stockholders was a gentleman from South Africa who was "in" for about $300,000, showing the kind of faith some foreign enthusiasts have in new manufacturing schemes in this country. Tucker is supposed to be completing an initial or pilot run of 25 cars which will be taken around the country for demonstration. Actual production is slated to begin in June and Preston Tucker, president, says he has corralled

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NEW LINCOLN: Plenty of bright metal—chromium plate and stainless steel—decorates the front end of the 1949 Lincoln Cosmopolitan. Unusual touches include recessed headlamps and heavy fender side moldings

enough steel to permit building 20 cars an hour by that time, on a one-shift basis.

Recently Tucker planked down $18 million for the plant of Aircooled Motors Inc. at Syracuse, N. Y., owned by Republic Aviation Corp. The plant employs about 400 and in past years has built a number of different types of automotive and aircraft aircooled engines dating back to the days of the old Franklin automobile engine. Tucker apparently will obtain his engines from this company and has indicated that production plans call for 100 units daily of a flat 6-cylinder opposed type. Eventually the operation will be transferred to Tucker's Chicago plant.

Those who have seen the Tucker car in mock-up form usually are pretty well sold on the design, even though it has been changed half a dozen times since the first conception.

Other Projects Varied

Other new automotive projects include the Playboy at Buffalo, the Bobbi-Kar at Birmingham, Ala., the Davis on the West Coast and possibly two or three others whose press agents have been ineffective. These are all small cars, aimed at the less-than-$1000 market, but their manufacturing is no less complicated as far as money, machines and material are concerned. The last word heard from the Playboy project is that it is being held up pending financing arrangements, original plans being to sell 20 million or so shares of stock for $1 per share.

The latest "paper" project in the automotive world is the projected Cortez car to be built by North American Motor Corp., organized by John Tjaarda, former Detroit automotive and industrial designer. Years ago he was employed by Briggs Mfg. Co. as a body stylist, later stepping out on his own in the design field. Ever since the war he has been fooling around with a motor car design and now apparently has interested some outside capital to join him in a manufacturing proposition, with possible locale in East Texas. Amidst the plushy surroundings of Palm Springs, Calif., Tjaarda has hooked up with Harry Bennett, former vice president of Ford Motor Co., and owner of a large ranch nearby, along with Norman De Vaux, once active in automotive circles around Detroit and later head of a Chevrolet distribution concern in California.

Ford Paper Mill Enlarged

Capacity of the Ford paper mill at the Rouge Plant has been doubled to meet production requirements for new models, a one-story addition helping to boost production to 80 tons daily. Product is panelboard, made from waste paper collected at the Rouge and used as foundation for body interior trim, upholstery backing, trunk and door liners and glove compartments. More than 40 pounds is used in each car.

Ford has developed a method of producing completely formed paper board sections by using the same press equipment and techniques employed in the fabrication of steel body panels. More than 300 different paper parts are made by a series of wet machines, dryers and presses which transform waste paper into rigid, water resistant and accurately cut sections which vary in weight from 4 ounces to 6.9 pounds and in size from 7 x 15 to 40 x 45 inches. Stock varies in thickness from 0.070 to 0.125 inch.

Small sections are made with conventional cylinder and jaw presses, using steel rule dies which cut through the stock in the forming of die-cut parts. Larger sections such as quarter panel body linings and door lining pieces, are precision cut on standard metal fabricating presses.

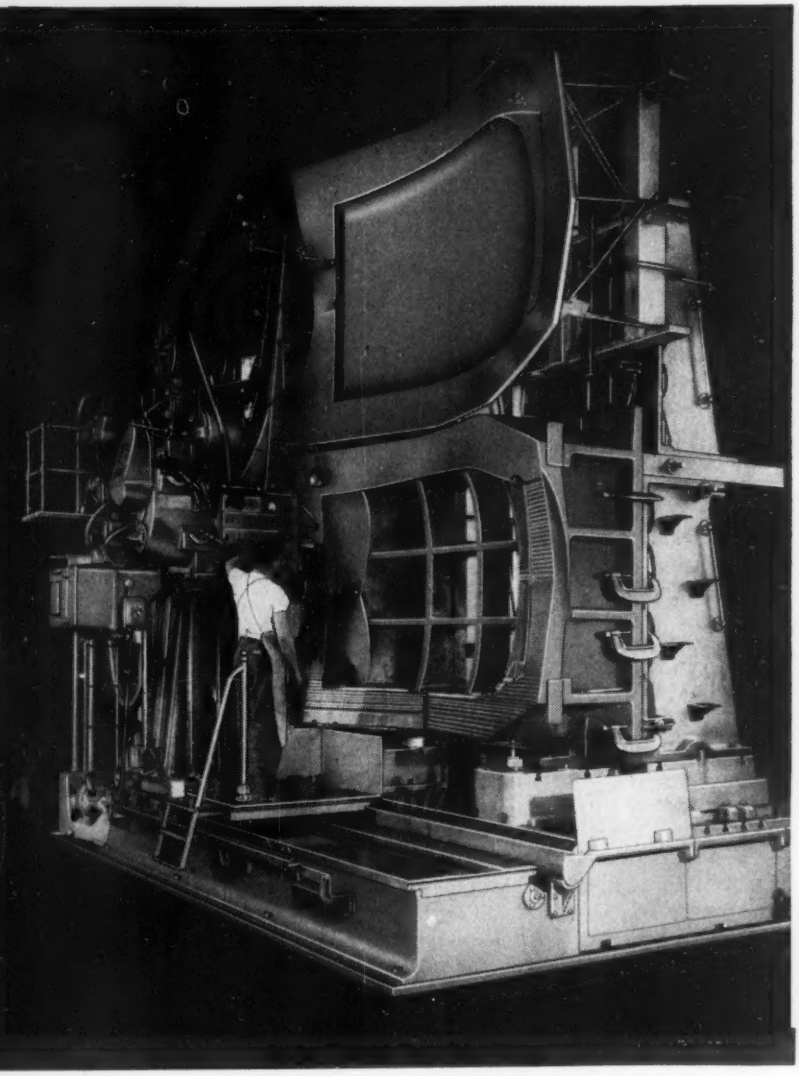
Lincolns Unveiled

Sloganed as the first 1949 cars in the automotive industry, the Standard and Cosmopolitan Lincoln models were unveiled officially last Thursday. The larger model is on 125-inch wheelbase, the smaller on 121 inches. Both are powered by a new 152-horsepower V-8 engine, the same as in the large Ford truck units. One-piece curved glass windshield is used on the Cosmopolitan, while the Standard model has the V-type; both are nearly 6 inches wider than any on previous models. Coil springs are on front wheels, longitudinal, semi-elliptic permanently lubricated leaf spring at the rear, coupled with a Hotchkiss drive and direct-action shock absorbers.

Engine has heavy forged crankshaft with integral counterweights. Bearings are triple-layer copper-lead alloy with steel backing. Separate exhaust systems for each bank of cylinders are located outside the engine V, permitting a better arrangement of accessories on top. Zero lash hydraulic valve lifters are used, while valve cooling has been improved by the use of one-piece valve guides, pressed into the block for better heat conductivity. Vibration is reduced by a viscous type, permanently sealed vibration damper operating in a silcone fluid.

Rear wheels are bolted directly to the flanged axle shaft, eliminating hubs and simplifying tire removal despite lower fender skirts. Curb weight of the standard model is 4100 pounds, of the Cosmopolitan 4600 pounds.

BIG DIES



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San Francisco Area Charts Development

BLUEPRINT for expanding and improving the San Francisco Bay area's economic structure is presented in a report just completed for the area's council of business, industrial and government officials in the nine counties of the district.

The 48-page report deals with basic factors affecting the development of the Bay area as a whole. It also provides additional incentive for co-operative action on projects and problems affecting future growth.

For example, it points out that while wartime population growth, diversified business expansions and the current high level of individual incomes make the San Francisco area's economic position better than that of many other regions, it is not secure enough that continued prosperity can be taken for granted.

Growth of the area's manufacturing employment from 1940 to 1947 has not greatly exceeded the nation's rate of increase as a whole, and has not equaled records of some other western areas. This, the report states, indicates need for increased effort in expanding industrial activity within the area.

Other phases of the report deal with transportation, governmental relations, land planning, water and shoreline developments, etc.

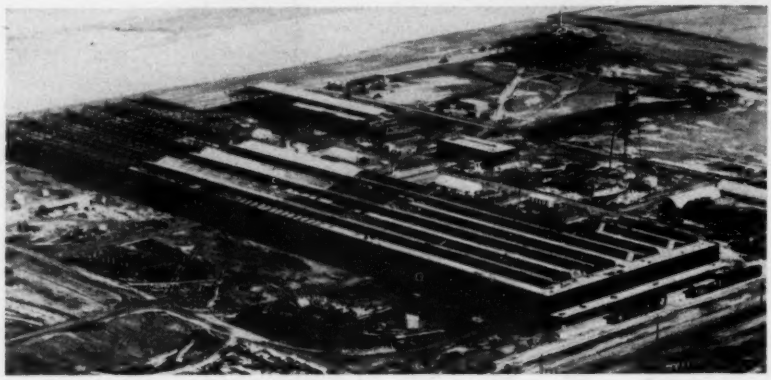
Employment and earnings of more than 5000 factory workers in the San Francisco area have been affected by the California power shortage. The severe winter drought caused a reduction in hydro-electric power supply with the result a mandatory cutback of 20 per cent in electricity use was ordered for all industrial and agricultural users. Recent rains have eased the drought but the restrictions on power use continue.

Survey shows that 39 plants, employing about 8 per cent of all production workers in 746 manufacturing plants in the San Francisco region, had been forced to curtail operations because of the power shortage.

German Diesel Lab Goes To Oklahoma College

The Klockner-Humbolt-Deutz diesel engine laboratory, formerly located at Oberursel, Germany, has been awarded to Oklahoma Agricultural & Mechanical College, Stillwater, Okla., John C. Green, director of the Office of Technical Services, Department of Commerce, has announced.

Allocation of this research equipment to the Oklahoma college was recommended by an Automotive Industry Advisory Committee which approached 114 educational institutions regarding the matter (STEEL, Jan. 12, p. 46). Oklahoma A & M will house the equipment in a building of its own and plans to spend more than $100,000 annually for research. The college is also establishing an Oklahoma Institute of Technology, a re-organization of the now existing engineering division.



NEW TUBE MILL: Wolverine Tube Division of Calumet & Hecla Consolidated Copper Co., Detroit, is building this tube mill at Decatur, Ala. Plant includes six buildings, occupying 368,300 square feet, will employ 350 people. Product will be seamless nonferrous tubing

Carnegie Sets 22 New Production Records

Carnegie-Illinois Steel Corp., Pittsburgh, U. S. Steel subsidiary, reports 22 production records were made during March at six Pittsburgh-Youngstown district plants.

Some of the records are: Total monthly production, exclusive of wheels and axles, of 883,791 tons at Homestead district works, compared with 872,632 tons in October, 1947; monthly record of 370,621 tons at Homestead for all open hearth furnaces, compared with 370,369 tons in October, 1947; monthly record of 25,045 rolled wheels at McKees Rocks, Pa., compared with 23,594 pieces in May, 1947; monthly record output of 14,525 tons at the electric furnace of the Duquesne works, compared with 14,463 tons in February; record total monthly production of 198,029 tons at McDonald works, compared with 197,934 tons in March, 1944; output of 44,770 tons at the three-stand cold reduction mill of the Irvin works, compared with 41,814 tons in December, 1947; production of 37,814 tons at the blooming mill of the Vandergrift, Pa., plant, compared with 32,119 tons in August, 1944.

Wheeling Modernization Program Progressing

The improvement and modernization program of Wheeling Steel Corp., Wheeling, W. Va., although delayed by a shortage of skilled workers and materials, progressed satisfactorily last year and approximately $8 million has been expended on the project, the company reports.

The program calls for construction of a battery of coke ovens and auxiliary equipment at the South Works, Steubenville, O., and installation of a continuous tube mill at the Benwood, W. Va., plant.

The original program, estimated to cost $30 million, has been revised in some respects to achieve maximum results upon completion. The revised estimated cost approximates $33 million. It is expected the program will be completed during the current year.

Superior Steel Buys New Cold Rolling Mill

Superior Steel Corp., Carnegie, Pa., has contracted for erection of a new Sendzimir cold-rolling mill. Carl L. Collins, president of the company, states that the mill, which is the latest type for steel rolling, will fit in perfectly with the hot mill sizes produced by Superior. He expects completion in about a month.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Johnson Metal Products Co., Erie, Pa., manufacturer of hardware, screens and other items, has merged with Detroit Steel Products Co., Detroit, which for many years has been marketing much of the Johnson line along with its own products. Robert S. van Cleve, president of Johnson, will be vice president of Detroit Steel Products, and the firm will become Erie Division of the Michigan company.

—o—

Lustron Corp., Columbus, O., manufacturer of prefabricated houses, has named Karstan Builders Inc., New York, Better Living Homes Inc., Maplewood, N. J., and C. B. Homes Inc., New Haven, Conn., as dealers.

—o—

Edgar Allen & Co. Ltd., Sheffield, Eng., is supplying the machinery to build a cement plant for Iraq Cement Co. on the Tigris river, a few miles from Baghdad.

—o—

Chase Brass & Copper Co., subsidiary of Kennecott Copper Corp., New York, has appointed Levinson Steel Sales Co., Pittsburgh, to handle its complete line of mill products in the Pittsburgh area.

—o—

Carbozite Protective Coatings Inc., Greensburg, Pa., manufacturer of industrial protective coatings, has appointed Glenn R. McClintock & Co., Pittsburgh, as a distributor.

—o—

B. & T. Engineering & Sales Co., Detroit, has been organized by Louis W. Blauman and E. Martin Tallberg to build die casting machines and to furnish engineering and consulting services to the die casting industry and to users of die castings.

—o—

Seamless Steel Tube Institute has moved its offices to 1901 Oliver Bldg., Pittsburgh. C. G. Macdonald is secretary.

—o—

Fairchild Engine & Airplane Corp., New York, announces it is conducting a study in the field of nuclear physics at Oak Ridge, Tenn., Apr. 19-24. A group of about 100 physicists, engineers and experts from the aircraft industry, educational institutions and the armed services will attend.

—o—

Sterling Tool Products Co., Chicago, manufacturer of portable sanding machines, has established a sales office and service depot at 405 W. Washington St., Los Angeles. I. C. Bouchard is in charge.

—o—

Iron Fireman Mfg. Co., Cleveland, expects soon to bring out two commercial oil burners and a twin system domestic heating plant. Firm recently began marketing a self-firing oil furnace and a small capacity, self-firing oil boiler.

—o—

National Tube Co., subsidiary of U. S. Steel Corp., Pittsburgh, reports that its National Works at McKeesport, Pa., shipped 6575 more tons of seamless pipe in March than in any previous month in the plant's 63-year history. This was made possible by a record March production of 109,353 tons of ingots and 87,430 tons of blooms.

—o—

Whiting Corp., Harvey, Ill., manufacturer of cranes, railroad and foundry equipment and other machinery, announces that effective May 1 its Chicago district sales office will be at 33 S. Clark St., and that effective May 10 the new address for its Pittsburgh district sales office will be 505 Liberty Ave.

—o—

American Railway Car Institute, New York, reports that production of railway freight cars in March increased to 9302, ten per cent higher that the February output.

—o—

Bituminous Coal Research Inc., Pittsburgh, has authorized an investment this year of $539,300 in a coal research program projected to increase markets and the efficiency of burning coal. This sum for general research is in addition to the budget for the group's Locomotive Development Committee.

—o—

Westinghouse Electric Corp., Pittsburgh, is developing four new locomotives. One is a free-piston gas turbine engine undertaken in conjunction with Lima-Hamilton Corp. Second is a steam-turbine locomotive being developed jointly with Babcock & Wilcox Co. Third is a larger electric model. Fourth, previously announced, is a gas turbine locomotive.

—o—

Atlas Imperial Diesel Engine Co., Oakland, Calif., has discontinued its diesel plant at Mattoon, Ill., and is concentrating production at Oakland. Move is part of a product diversification program. Firm now makes tin cans, can machinery and food processing equipment, in addition to diesel products.

—o—

Pullman-Standard Car Mfg. Co., Chicago, has opened a third assembly line, at its Bessemer, Ala., plant, for production of P-S-1 or "package" box cars. The other two lines are at Michigan City, Ind.

—o—

Maryland Car Wheel Co., Baltimore, manufacturer of railroad car wheels since 1899, has been dissolved. Company's equipment has been sold to American Brake Shoe Co.

—o—

Resistance Welder Manufacturers' Association, Philadelphia, announces that $2000 in prizes will be awarded in 1948 for papers on resistance welding.

—o—

Chemicals Division, Glenn L. Martin Co., Baltimore, has made first shipments of vinyl resins used in the plastics field from its new $6 million plant at Painesville, O.

—o—

Hunter Pressed Steel Co., Lansdale, Pa., manufacturer of springs, wire forms and stampings, has shifted its entire spring production from plants No. 1 and 3 in Lansdale, to its new facility on 1 Spring St., Lansdale.

—o—

Great Lakes Plating Co., Chicago, has voted to change its name to Great Lakes Industries Inc. Change was made because of the firm's acquisition of Chicago Watchclock Corp. last fall and the possibility of further diversification in the future.

—o—

American Car & Foundry Co., New York, has formed a new division to be known as Tool & Die Control. H. O. Amble will be in charge and will make his headquarters at the ACF Berwick, Pa., plant.

—o—

Lindberg Engineering Co., Chicago, manufacturer of industrial heat treating and melting furnaces, has acquired the Electronics Division of Illinois Tool Works, Chicago, and will continue to manufacture and sell the division's high frequency induction and dielectric heating equipment. Operations will continue at Illinois' plant until June 1 and then will move to the Lindberg facility.

—o—

Cold Metal Products Co., Youngstown, producer of cold-rolled steel strip, has opened a district office in the Illinois Bldg., Indianapolis. L. B. Warstler is in charge.

The Business Trend

OPERATION CURTAILMENTS accelerated in the fourth week of the coal strike. Gambling that settlement of the pension dispute would be prompt, many industries "shot the works" and kept going full tilt. However, in the week ended Apr. 10, as coal piles emptied rapidly, cutbacks were sharp and prospects for fast return to normal operations grew blacker. STEEL's index of industrial production dropped eight points to 146 per cent (preliminary) of the 1936-1939 weekly average, the lowest point since the Christmas holiday week.

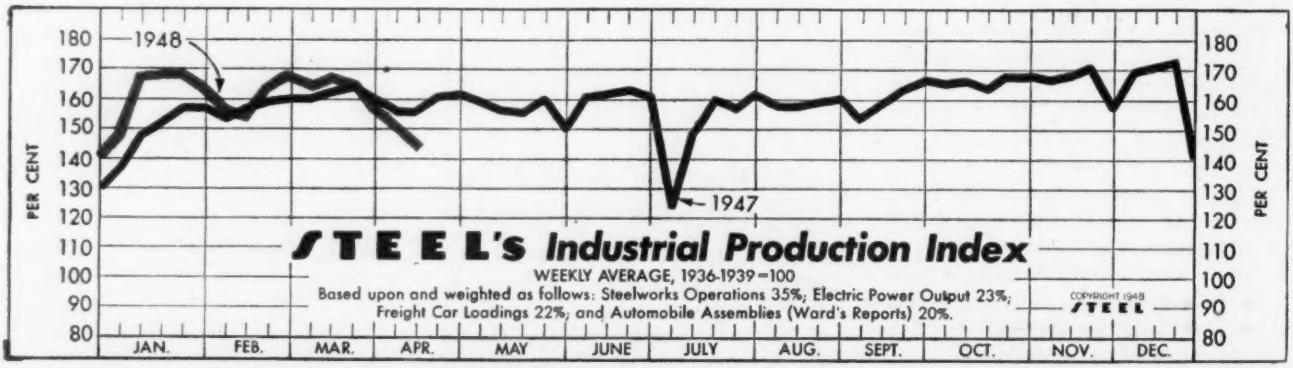
COAL—Coal tonnage lost from Mar. 15 to Apr. 10 is estimated at 44 million tons, only about five million tons less than stocks on hand at the beginning of March. According to the Bureau of Mines, total supply of bituminous coal at that time at industrial plants and in dealers' yards amounted to 28 days at normal rate of consumption. March coal production averaged 1,260,000 net tons daily for a total of 34,016,000 tons. This compared with February average daily output of 2,016,000 net tons, or a total of 48,390,000 tons. Cumulative production for the year is about 17 per cent less than for the corresponding 1947 period.

COKE—Prior to the coal walkout, production of oven coke reached an all-time record daily rate, February's daily output standing at 190,098 net tons. Total production of oven and beehive coke amounted to 6,051,701 net tons, a 6.5 per cent decline from the previous month as the result of the shorter work-month and the closing of a number of beehive ovens.

STEEL—By Apr. 10 finishing mills and other steel users were short a half-million tons of raw steel as the result of the coal mining suspension. The national rate averaged 78.0 per cent of capacity in that week and operations were due for further cuts. Finished product shipments have only started to reflect this loss, and civilian goods producers expect to have to bear the brunt of expected quota cuts so that preferential program commitments can be met.

AUTOS—Although automobile and truck production was well maintained throughout the first four weeks of the coal strike, largely because steel output was kept high, the future loss in vehicles because of depleted inventories will amount to at least two full weeks' production, according to *Ward's Automotive Reports.*

RAILROADS—Urgency of the freight car problem is temporarily forgotten as volume of carloadings drops, but order backlogs for new cars are still increasing. As of Mar. 1, new freight cars on order totaled 121,936, compared with 119,711 on Feb. 1, Class I railroads also had on order on Mar. 1 1596 locomotives, the most since Aug. 15, 1923, when the number was 1674. Orders by Class I roads and railroad-operated refrigerator companies include 35,860 box cars, 48,085 hopper cars, 16,526 gondolas, 1025 flat cars, 5338 refrigerator cars, 800 stock and 765 miscellaneous freight cars. Locomotives on order include 108 steam, two electric and 1486 diesel.



Index (chart above): Week ended Apr. 10 (preliminary) 146 Previous Week 154 Month Ago 167 Year Ago 156

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	78.0	88.5	95.5	96.5
Electric Power Distributed (million kilowatt hours)	5,033	5,037	5,285	4,620
Bituminous Coal Production (daily av.—1000 tons)	355	353	2,171	666
Petroleum Production (daily av.—1000 bbl.)	5,377	5,389	5,256	4,913
Construction Volume (ENR—Unit $1,000,000)	$93.8	$218.8	$96.0	$125.2
Automobile and Truck Output (Ward's—number units)	102,950	105,132	114,689	97,893

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

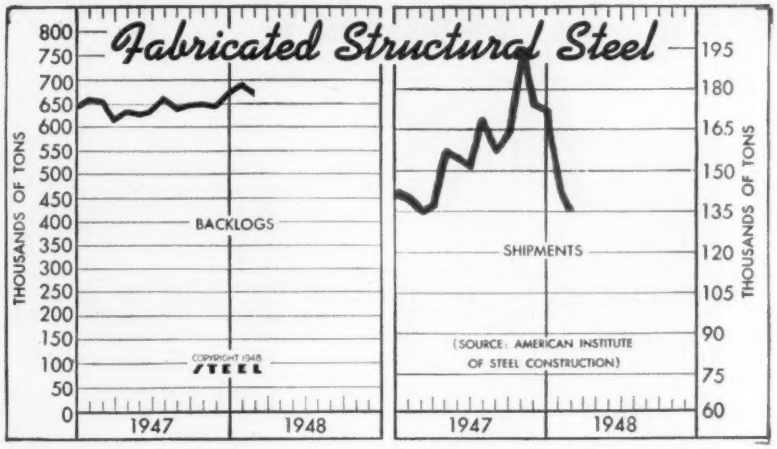
TRADE				
Freight Carloadings (unit—1000 cars)	650†	662	797	758
Business Failures (Dun & Bradstreet, number)	79	91	102	59
Money in Circulation (in millions of dollars)‡	$27,833	$27,780	$28,006	$28,250
Department Store Sales (change from like wk. a yr. ago)‡	−12%	+17%	+5%	+17%

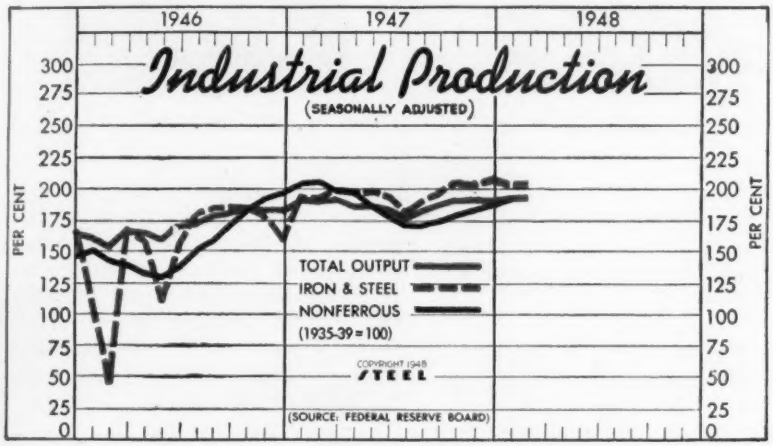
† Preliminary. ‡ Federal Reserve Board.

Fabricated Structural Steel

(000 Tons)

	Shipments			Backlogs		
	1948	1947	1946	1948	1947	1946
Jan.	144.3	140.6	107.5	692	661	552
Feb.	135.7	136.1	63.8	673	656	551
Mar.	....	137.8	102.8	...	614	605
Apr.	....	157.4	122.5	...	632	674
May	....	155.0	124.4	...	628	615
June	....	151.9	126.8	...	634	642
July	....	169.9	140.2	...	661	674
Aug.	....	158.0	157.5	...	639	651
Sept.	....	164.3	141.9	...	648	682
Oct.	....	196.1	164.7	...	649	660
Nov.	....	175.0	157.3	...	645	665
Dec.	....	173.0	142.1	...	671	646
Total	....	1,915.1	1,551.6			





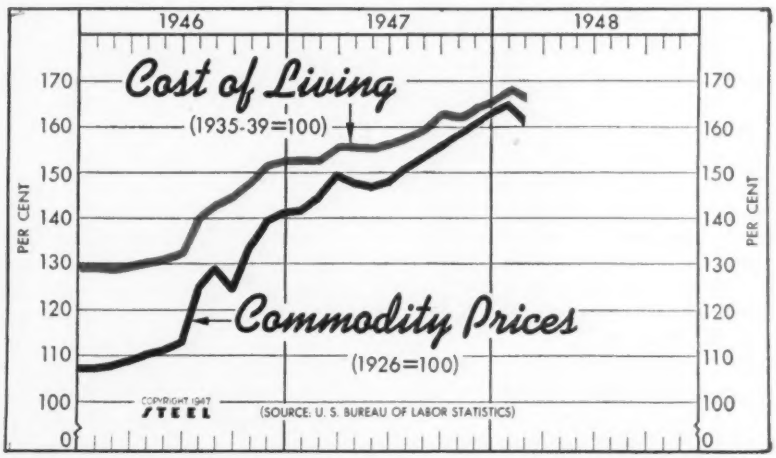
Federal Reserve Board's Production Indexes

(1935-39=100)

	Total Production		Iron, Steel		Nonferrous	
	1948	1947	1948	1947	1948	1947
Jan.	193	189	203	192	194	203
Feb.	193	189	202	191	...	208
Mar.	...	190	...	196	...	199
Apr.	...	186	...	195	...	197
May	...	185	...	197	...	187
June	...	184	...	193	...	179
July	...	177	...	181	...	172
Aug.	...	182	...	188	...	171
Sept.	...	186	...	195	...	174
Oct.	...	190	...	204	...	179
Nov.	...	192	...	202	...	185
Dec.	...	192	...	205	...	189
Ave.	...	187	...	195	...	186

Wholesale Commodity Price—Cost of Living Indexes

	Commodities (1926=100)			Living Cost (1935-39=100)		
	1948	1947	1946	1948	1947	1946
Jan.	165.6	141.5	107.1	168.8	153.3	129.9
Feb.	160.7	144.5	107.7	167.5	153.2	129.6
Mar.	....	149.5	108.9	....	156.3	130.2
Apr.	....	147.7	110.2	....	156.2	131.1
May	....	147.1	111.0	....	156.0	131.7
June	....	148.0	112.9	....	157.1	133.3
July	....	150.8	124.7	....	158.4	141.2
Aug.	....	153.6	129.1	....	160.3	144.1
Sept.	....	157.4	124.0	....	163.8	145.9
Oct.	....	158.5	134.1	....	163.8	148.6
Nov.	....	159.7	139.7	....	164 9	152.2
Dec.	....	163.2	140.9	....	167.0	153.3
Ave.	....	151.8	120.9	....	159.2	139.3



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,724	$12,925	$11,724	$10,846
Federal Gross Debt (billions)	$252.4	$253.1	$254.1	$257.9
Bond Volume, NYSE (millions)	$25.0	$22.6	$16.0	$18.9
Stocks Sales, NYSE (thousands)	6,473	6,651	3,987	4,664
Loans and Investments (billions)†	$62.2	$63.2	$63.5	$63.0
United States Gov't. Obligations Held (millions)†	$34,433	$35,469	$35,845	$38,850

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$81.14	$81.14	$81.14	$69.82
All Commodities†	160.1	161.1	160.4	148.8
Industrial Raw Materials†	174.8	175.9	176.5	164.0
Manufactured Products†	154.9	155.9	154.3	142.8

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

DAVID M. SALSBURY

E. F. NASON

EDMUND G. PRICE

David M. Salsbury has been elected president of the Westinghouse Electric Supply Co., New York. Mr. Salsbury has been executive vice president of WESCO, a wholly-owned subsidiary of Westinghouse Electric Corp. since 1946, and vice president since 1944. He succeeds **B. W. Clark,** who held the posts of president of WESCO and vice president in charge of sales of the parent company. Mr. Clark will continue to have responsibility for all sales activities of the Westinghouse Electric Corp.

—o—

Mathieson Chemical Corp. (formerly Mathieson Alkali Works) announces election of **Thomas S. Nichols** as president and chief executive officer. **George W. Dolan,** formerly president, has been elected chairman of the board, succeeding **A. U. Fox,** resigned. **John C. Leppart** has been elected vice president. Mr. Nichols was formerly vice president and director of Prior Chemical Co.

—o—

Roy J. Keller, general sales manager of TelAutograph Corp., New York, has been elected a vice president. He joined the communications manufacturer in 1924, serving in various capacities until 1945, when he was appointed general sales manager.

—o—

J. I. Case Co., Racine, Wis., announces that **Leon R. Clausen,** president, has resigned to become chairman of the board, but will continue in charge of production engineering, research and development. He is succeeded as president by **Theodore Johnson,** formerly executive vice president. **A. R. Hauschel,** manager of foreign sales and a director, and **Carroll G. Pearse,** manager of domestic sales, were elected vice presidents. **D. P. Davies** has retired as vice president.

—o—

E. F. Nason has been appointed general sales manager of Elastic Stop Nut Corp. of America, Union, N. J. He was aircraft sales and product manager for the past six months, and for the two years previous had been participating in service engineering and sales development work. He had formerly been associated with Pratt & Whitney Division, United Aircraft Corp., East Hartford, Conn., in the engineering department.

—o—

The election of four executives of Oliver Corp., Chicago farm implement manufacturer, to newly created vice presidencies, has been announced by the company: **A. King McCord** has been promoted from vice president-operations, to first vice president of the company. **O. E. Eggen,** director of engineering, has been elected vice president. **R. E. Melvin,** general works manager, has been promoted to vice president in charge of manufacturing at the company's Charles City, Battle Creek and Cleveland plants, and **C. L. Hecker,** general manager of South Bend plants, to vice president - manufacturing at South Bend, Shelbyville and Springfield plants.

—o—

Peter D. White has been elected president of Babcock & Wilcox Tube Co., a subsidiary of Babcock & Wilcox Co., New York. He has been with the Babcock & Wilcox organization for 33 years. During the past year he has been executive vice president and a director, and previously was a vice president for five years. **Luke E. Sawyer,** general superintendent of the tube company since 1939, has been elected vice president and general manager. **E. A. Livingstone,** general sales manager since 1939, has been elected vice president in charge of sales.

—o—

Edmund G. Price has been elected vice president in charge of operations of the National Tube Co., a U. S. Steel Corp. subsidiary. He succeeds **E. N. Sanders,** who has been named assistant to the vice president of engineering and operations for the U. S. Steel Corp. Mr. Price has been associated with the company since 1924, and after many years at the Lorain, O., Works, was appointed general superintendent of the McKeesport, Pa., works in 1946. **Ralph M. Overton** has been appointed assistant vice president - operations of National Tube. He has been on the staff of the vice president of engineering operations of U. S. Steel Corp. of Delaware. **T. H. Kennedy** has been appointed general superintendent of the company's National Works at McKeesport, Pa., succeeding Mr. Price.

—o—

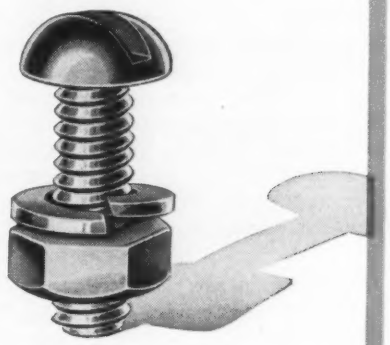
Royal A. Stone has been appointed chief engineer for the eastern district of H. K. Ferguson Co., with headquarters in New York.

—o—

Norman J. Collister has been appointed vice president of Frederick Hart & Co., an associate company of American Type Founders Inc., New York. He will continue as general sales manager, in which capacity he joined the company in 1947, after serving as sales manager of the

This takes 8 seconds . . .

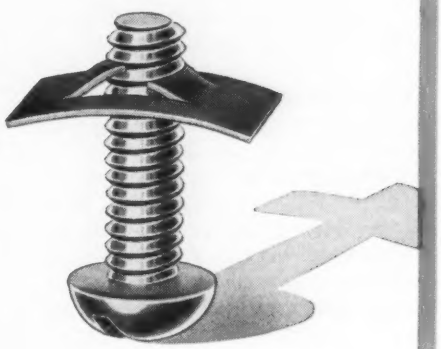
That's the average time required to install a threaded nut, lock washer and screw, using a power screwdriver.



This takes 5 seconds . . .

A savings of 37½% in time—because no lock washer is needed—no wrench is ever required! SPEED NUTS* start easier, pull down faster.

NOTE: Figures based on study conducted by independent time-study engineers.



The stop watch tells the story. Flat-type SPEED NUTS can be applied much faster than threaded nuts and lock washers. This time-savings can mean real dollar-savings in your assembly costs.

Time-saving is a primary feature of the entire SPEED NUT System of Fastenings. Push-On type SPEED NUTS zip over unthreaded studs. SPEED CLIPS snap into position. SPEED CLAMPS combine several parts into one for quick installation.

Here's an example of proved savings: A leading vending machine manufacturer has reduced his assembly costs 25% with the SPEED NUT brand of fasteners. *Your* specific fastening problems may be answered in a comprehensive analysis prepared by Tinnerman engineers. Write for details on this service, and for your copy of the new SPEED NUT bulletin. TINNERMAN PRODUCTS, INC., 2038 Fulton Rd., Cleveland 13, Ohio.

In Canada: Dominion Fasteners Limited, Hamilton
In England: Simmonds Aerocessories, Ltd., Treforest
In France: Aerocessoires Simmonds, S.A., Paris

TINNERMAN Speed Nuts® *Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS — MORE THAN 4000 SHAPES AND SIZES

Electric Typewriter Division, International Business Machines Corp.

—o—

Graybar Electric Co. Inc., New York, announces that **G. J. Cossmann,** director and district manager at Chicago, has been made a voting trustee; **A. C. Lamperti,** secretary and comptroller and director, has been made a member of the executive committee; and **R. B. Wilkinson,** treasurer, has been made a director.

—o—

Fort Duquesne Steel Co., Pittsburgh, processor and distributor of flat rolled steel products, has appointed **Judson H. Scott** as its district sales representative in Rochester, N. Y., and surrounding area.

—o—

Leo Schirtzinger has retired as Cincinnati district sales manager of Century Electric Co., St. Louis. The Cincinnati office will now be in charge of **P. F. Williams** and **W. C. Wetlaufer.** Mr. Williams assisted Mr. Schirtzinger in the Cincinnati territory for many years, and Mr. Wetlaufer served in the St. Louis district sales office and the general office in that city.

—o—

Reed Rolled Thread Die Co., Worcester, Mass., has appointed **Edward F. Galvin** of the Tool Sales Co. as its representative in metropolitan New York and southwestern Connecticut. He will have headquarters at New York.

—o—

Robert C. Wolf has joined the Horace T. Potts Co., Philadelphia, warehouse distributor of steel and steel products, as a field engineer to assist customers in the layout and application of stainless steel tubing, fittings, etc.

—o—

D. G. Hubbard has been appointed manager of the new branch office opened at Aberdeen, S. Dak., by Graybar Electric Co. Inc., New York. He has been associated with the company since 1936.

—o—

Chemical Corp. of Colorado, Denver, announces the appointment of **Dr. Daniel E. Bonnell** as vice president in charge of sales.

—o—

Jones & Laughlin Steel Corp., Pittsburgh, announces that **Walter H. Lewis,** formerly assistant manager of orders, has been appointed manager, order department, and that **Paul L. Tietjen** has been appointed to the new office of director of water transportation, but continues as manager of Interstate Steamship Co., a subsidiary of the corporation. In his new position, Mr. Tietjen will also have charge of all river transportation facilities owned by the corporation.

—o—

George D. Mitten has been named manager of the Argonaut Realty Division of General Motors Corp., Detroit, to succeed the late **Fred H. Linscheid.** Mr. Mitten has been associated with Argonaut since 1928 and with General Motors since 1919. In recent years he has directed engineering activities in the division and acted as assistant to Mr. Linscheid.

—o—

William Tennant has been appointed New York district representative for the conduit products of General Electric Co., Schenectady, N. Y. He formerly had been connected with the company's wiring device and wire and cable sales sections in Bridgeport, Conn.

—o—

Maxim M. Cohen, formerly in charge of the Dock and Waterway Divisions of the North Pier Terminal Co. and East Chicago Dock Terminal Co., Chicago, is now associated with M. S. Kaplan Co., Chicago, in connection with the purchase and sale of iron and steel scrap.

—o—

Morse Chain Co., Detroit, announces appointment of **D. C. McNeely as** manager of the Morse-Rockford Sales Division. Mr. McNeely retains his position as manager of Morse distributor sales.

—o—

H. H. Robertson, president of H. H. Robertson Co. since its establishment in 1906 in Canton, Mass., has resigned, but continues as chairman of the board. **Dr. J. H. Young,** vice president and general manager since 1940, has been elected president to succeed Mr. Robertson. **W. S. Tallman** has retired as vice president, but will continue as a director. He has been with the firm 28 years. **H. H. Crafton,** manager of production, and **A. W. Hedgren,** manager of sales, have been elected vice presidents; **G. B. Moore** has been chosen treasurer, and **J. K. Davis,** secretary.

—o—

Bert E. Dwyer has been appointed manager of Bethlehem Pacific Coast Steel Corp., with headquarters at the company's general offices, San Francisco.

—o—

Frank M. Smith has been appointed comptroller of Rack Engineering Co., Pittsburgh.

—o—

Yarnall-Waring Co., Philadelphia, announces the following appointments in its sales department: **R. S. Pollard,** formerly of Pyle-National Co., has been made sales manager of the Steam Trap Division; **Leland C. Campbell,** appointed southwestern representative, working from the Dallas, Tex., sales office; **Howard R. Wunker,** appointed sales representative in the company's new Cincinnati office; and **J. Frank Long,** appointed sales representative in the St. Louis office.

—o—

Joseph H. Humble, Kester Solder Co., Chicago, has been appointed general sales and advertising manager of the company.

—o—

H. J. Sprechen Sr., superintendent, automotive foundries, International Harvester Co., Chicago, has retired. He became associated with the company in 1922 as superintendent of the gray iron foundry at the Tractor Works, Chicago, and in 1930 was promoted to the post from which he has retired.

—o—

James M. White, formerly vice president-manufacturing at Allis-Chalmers Mfg. Co. at the Milwaukee plant, has joined the Allen-Bradley Co., Milwaukee, production management staff, in which capacity he will investigate cost and inventory methods and participate in handling production management problems.

—o—

Bruce E. Tau has been elected a vice president of Freyn Engineering Co., Chicago. He has been associated with the company since 1931.

—o—

W. D. Little has retired as president and general manager of Hoskins Mfg. Co., Detroit, but will remain on the board of directors, of which he was recently named chairman. He became associated with Hoskins in 1912, and has served most

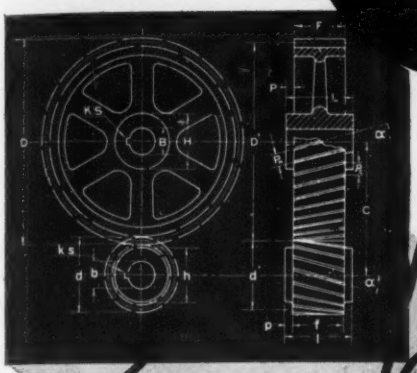
BRUCE E. TAU

4 Points to Remember

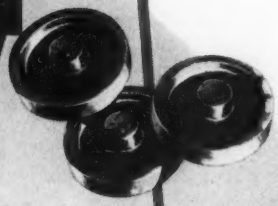
when you want the

FINEST

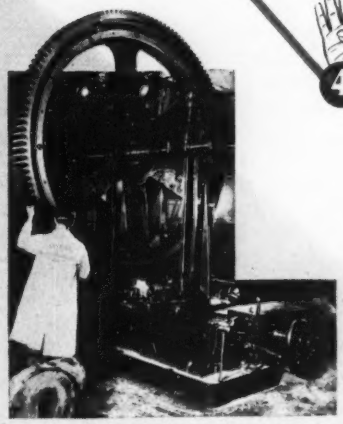
IN GEARS



ONE—Years of specialized gear manufacturing experience is at your service when you come to Illinois Gear & Machine Company.

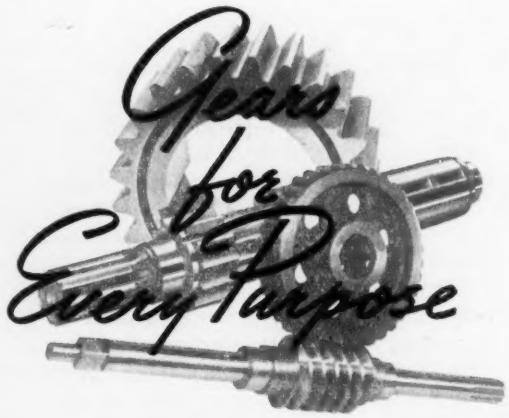


TWO—Performance studies made in every field of gear application plus rigid standards in material selection . . . assure gears with an inherent high quality to fit the demands of the application you specify.



THREE—At Illinois Gear & Machine Company, complete modern production facilities provide precision work with speed and economy. Unique in maintaining quality at lower cost is the long-proved "in-production" inspection system.

FOUR—Final Inspection at Illinois Gear & Machine Company is a final assurance that ALL gears delivered on your order will be of consistent top quality, finished exactly per your specifications.



To demonstrate the advantages and convenience to you of the Illinois Gear & Machine Company service . . . let us quote on your next requirement in gears. Write for your copy of Catalog No. 39.

ILLINOIS GEAR & MACHINE COMPANY

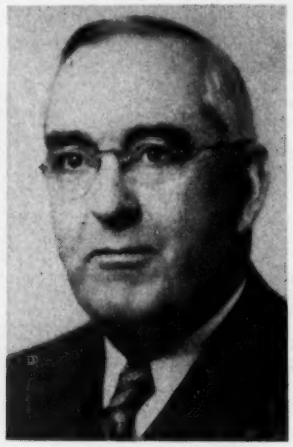
CHICAGO 35, ILLINOIS

FRANCIS DOUGHERTY JR.

Elected president, F. J. Stokes Machine Co., Philadelphia. Noted in STEEL, Apr. 12 issue, p. 74

FRANK R. PALMER

Who has been elected president, Carpenter Steel Co., Reading, Pa. Noted in STEEL, Apr. 5 issue, p. 45



J. HEBER PARKER

Elected chairman of the board, Carpenter Steel Co., Reading, Pa. Noted in STEEL, Apr. 5 issue, p. 45

of that time as sales manager. He became president in 1944. **W. H. Brown,** formerly assistant general manager, has been named president and chief executive officer.

—o—

F. J. Staroba, formerly sales engineer for Carboloy Co. Inc., Detroit, has been appointed to the position of manager of the midwestern district for the company, with headquarters in Chicago. Mr. Staroba succeeds **W. D. Bronson,** who recently resigned to form his own company.

—o—

Pittsburgh Steel Co., Pittsburgh, announces appointment of **R. N. Shields** as assistant general traffic manager. He formerly was assistant traffic manager, Pittsburgh branches, United States Steel Corp. subsidiaries.

—o—

E. C. Lanno, formerly associated with Detroit Diesel Engine Division, General Motors Corp., Detroit, has been named development engineer of the Rockford, Ill., Clutch Division of Borg-Warner Corp., Chicago. He succeeds **L. F. Mohns,** resigned.

—o—

Hugh Morrow, who has been president of Sloss Sheffield Steel & Iron Co., Birmingham, since 1925, has been elected chairman of the board, and **Claude S. Lawson,** former vice president, succeeds Mr. Morrow as president. **John S. Coleman,** president, Birmingham Trust National Bank, has been elected a director.

—o—

Thomas T. Parker, pressed metal manufacturing engineer, has assumed a new post in that capacity at the Portland, Oreg., plant of Hyster Co. He had been assistant to the superintendent at By-Products Steel Corp., Coatesville, Pa., subsidiary of Lukens Steel Co.

—o—

Carl I. Collins has been elected a director of National Supply Co., Pittsburgh, to succeed **T. H. McGraw Jr.,** retired. Mr. Collins is president of Superior Steel Corp., Pittsburgh, and is also a director of American Iron & Steel Institute.

OBITUARIES . . .

Leon H. Marsh, vice president and secretary, Kennedy Valve Mfg. Co., Elmira, N. Y., died Mar. 11 following a heart attack. He had been a member of the Valve Manufacturers Association since 1938, and was a director of the association for 1946 and 1947.

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Lawrence E. Eveslage, 58, vice president and sales manager since 1930 of Morrison-Drabner Steel Co., died at his home in Cincinnati, Apr. 11.

—o—

Charles A. Criqui, 82, retired president, Sterling Engine Co., Buffalo, and one of the original directors of Bell Aircraft Corp., Niagara Falls, N. Y., died in Miami Beach, Fla., Apr. 9.

—o—

Stanley H. Millspaugh, 59, chief designer and engineer, Thomas A. Edison Inc., at its plant at West Orange, N. J., died Apr. 9, after a long illness.

—o—

Clinton G. Parker, 40, controller and assistant secretary, Fawick Airflex Co. Inc., Cleveland, died Apr. 13.

—o—

John F. Reed, 58, who retired a year ago as vice president, American Filter Co., New York, died Apr. 3 of a heart attack.

—o—

Alexander L. Bletz, 53, plant engineer for a number of years for SKF Industries Inc., Philadelphia, died Apr. 1 following a long illness.

—o—

Harold A. Richmond, founder and chairman of the board of General Abrasive Co. Inc., Niagara Falls, N. Y., died Apr. 8. He founded the company in 1916.

—o—

George E. Whittaker, 51, plant engineer for Chase Brass & Copper Co. Inc., at Cleveland, died Apr. 11. He was a past president of the Cleveland Chapter, Association of Iron & Steel Engineers, and a member of the American Institute of Electrical Engineers.

—o—

Clarence W. Hays, 74, secretary and sales manager, Stroh Process Steel Co., Pittsburgh, died Apr. 6.

—o—

David Findlay, former president, L. S. Starrett Co., Athol, Mass., died recently. He was associated with the company for 55 years, and retired in 1946.

—o—

L. L. Goldsmith, 51, vice president, B. G. Corporation, New York, died recently.

—o—

Richard F. Jordan, 62, vice president-sales, Sterling Wheelbarrow Co., Milwaukee, died recently.

—o—

Roland F. Smith, 44, vice president, treasurer and general manager, Waukesha Foundry Co., Waukesha, Wis., died recently.

How Law 413
STREAMLINES BUYING
for Military Requirements

BY JOSEPH L. HOWARD
Lt. Comdr. (SC) USN

For the first time in U. S. history, uniform procurement procedure is set up for all branches of the armed services under new legislation effective May 19, 1948

● There is nothing quite like the sensation of driving a sleek new car over a smooth highway after years of operating a dilapidated old jalopy that hung together only with the help of chicken wire and friction tape. Under the Armed Services Procurement Act of 1947, a similar sensation is being experienced by military procurement officials who struggled for years prior to the war under antiquated procurement statutes which only hampered and impeded our defense effort.

In this postwar period of ultra-streamlined cars, television sets, and the "New Look," military purchase laws, too, have come in for a share of modernization. After 80 years of various and sundry enactments which by 1941 were but a patchwork of miscellaneous procurement laws, the services have recently been granted a statutory authority which is a truly streamlined model of peacetime procurement legislation.

Public Law 413 provides a smooth new vehicle that needs no overhauling or alteration to meet the challenges of industrial mobilization, and as a peacetime measure it provides the means for real economy in the procurement of military supplies.

This new law, which becomes effective May 19, 1948, is a preparatory measure which makes the purchase function a vital and dynamic instrument of national defense. In the event of any sudden national emergency, this law automatically provides the military departments with the kind of procurement authority they need to meet the crisis.

Historically, Public Law 413 owes its importance to the fact that for the first time in U. S. history all defense arms, including the Coast Guard and the National Advisory Committee for Aeronautics, are drawn together under a single procurement statute which applies equally and uniformly to each agency.

By thus unifying basic procurement policy among several governmental agencies, the new law will contribute greatly to the elimination of confusion among suppliers who in other years did business with various government departments under widely different sets of ground rules.

The Army, Navy and Air Force are currently developing an Armed Services Procurement Regulation which will constitute a completely uniform policy interpretation of the law. While this regulation covers only broad policy matters and does not attempt to reconcile all procedural differences, the influence of the new law in standardizing policy is already being felt.

It is significant to note that this act primarily covers the methods each service will use in buying to fill its needs, and does not particularly involve any effort to co-ordinate procurement by fiat. It does, however, simplify co-ordination both because it brings the services under identical legislation and it provides authority to utilize various methods of purchase co-ordination.

The basic feature of the act is its re-establishment of the advertisement and sealed competitive bidding method of procurement as basic policy. While this is a return to prewar policy, the law takes the practical view of recognizing certain exceptional commercial situations wherein sealed bidding procedures are inadequate for an effective buying job.

Most of these exceptional situations were recognized prior to the war, but they were so couched in legal terminology, and spread among so many different statutes, that it was difficult for the uninitiated procurement officer or supplier to know just where he stood from a legal standpoint in contracting.

Public Law 413 clears the air considerably in this respect by codifying these exceptions in concise language

within the law. To those situations which existed prior to the war have been added certain further exceptions which demonstrated their essentiality by the experience of the late war.

Thus, in one statute Congress has provided the nation with a significant defense instrument, has unified procurement policy among several government departments, has repealed outmoded laws, and has codified the best features of eighty years of procurement experience in peace and war.

Features of the Law

In returning to permanent peacetime purchasing policies, the military departments will make the bulk of their purchases through formal competitive bidding procedures. One important change from prewar practice is in the form and method by which the government may advertise its intentions to buy.

Rather than advertise uniformly in certain journals and newspapers as in prewar years, the government may solicit bids in conformance with the accepted practices of the industry concerned. Thus, announcements may be made in trade journals, newspapers, on bulletin boards, or by whatever means the situation demands. This in itself will be a time and money saver in the formal sealed bid process.

The old concepts of "open market purchases" and buying "in a manner common among businessmen" are supplemented by a new and broader concept of "negotiation." In plain language this simply means bargaining. By the process of negotiation the participants in a business transaction are able to discuss and reach agreements on prices, deliveries, and other terms which ultimately lead to a binding contract between buyer and seller.

Thus, while sealed bidding procedures will be basic policy, negotiation may be used in any of the following situations:

(1) National Emergencies: If the President officially proclaims a state of national emergency, the services are automatically free from the restrictions of normal peacetime procedures and may employ such purchase methods as will most effectively mobilize industry for war production. This section of the law constitutes automatic procurement war powers and it eliminates the need for special legislation.

(2) Public Exigencies: A public exigency, by generally accepted definition, is a momentary or temporary emergency requiring immediate action to avert or alleviate sudden disaster. Exigencies are of three general types. (a) Act of God disasters such as earthquakes, tidal waves, hurricanes; and major accidents such as fires and explosions affecting wide areas are typical of one type of exigency. (b) Military or operational crises which prejudice the best interests of defense are another type of exigency. (c) Critical situations arising from international commitments and obligations are illustrative of the third type of exigency. An example of this latter category may be the immediate purchase and shipment of oil to a foreign ally who is threatened by a common potential enemy.

If procurement action is required to meet any of these types of public exigencies, the authority of this section may be invoked to negotiate the purchase in lieu of the time-consuming advertising procedure.

(3) Purchases under $1000: This is simply an extension of two forty-year-old statutes which originally authorized the services to make "open-market" purchases up to $500.

(4) Personal or Professional Services: This is another prewar authority, codified in Public Law 413 for use in contracting for technical, scientific, engineering and other professional services.

(5) Services of Educational Institutions: This authority is designed principally for use in the administration of the Holloway Plan, an educational program in which the Navy enters contracts with colleges and universities for academic training of naval personnel, but it also covers any other contracts with educational institutions.

(6) Outside Continental U. S.: Whenever purchases are for supplies or services to be used outside the continental limits of the U. S. it is generally appropriate to negotiate contracts rather than submit to the hazards of ungenuine competition. Anyone who has had an American dollar to spend in a foreign land can testify to the applicability of bargaining power.

(7) Medicines and Medical Supplies: While formal competitive bidding procedures will be the primary method of obtaining standard medical items, it has long been recognized that the purchase of certain special items cannot be effectively consummated through sealed bidding methods. Thus, where circumstances warrant, this exception provides authority to negotiate.

(8) Resale Items: Here again, long-standing precedent permits the purchase of proprietary items where consumer demands in commissary stores and other retail outlets must be met.

(9) Perishable Subsistence Items: This exception is a codification of another prewar authority. Although competition is sought and encouraged whenever possible, the purchase of fresh provisions frequently demands a quicker and less formal method than the advertisement procedure.

(10) Competition Impracticable: Although this exception is backed by many years of precedent, it has been broadened somewhat to include additional exceptional situations which the experience of recent years has shown to require negotiation.

The instances in which this exception may be used are roughly divided into two categories, i.e., where it is impracticable to secure competition because of the peculiarity of (a) the items or services themselves, or (b) the situation surrounding the particular purchase.

Under the "peculiar item" category there are three types of cases. (a) There may be no competition because only one company holds patent rights, or has secret processes which preclude the manufacture of such items by other producers. (b) Competition may be impracticable because the exact nature of the work to be done is not known; hence definite specifications and description of the work cannot be drafted for an invitation for bids. This situation exists frequently in ship repair and maintenance contracts where the full extent of the work cannot be determined until work is already in progress. (c) Competition is frequently impracticable when a proposed contract is for commercial ocean transportation, including time, space, and voyage charters over ocean lanes not covered by common carriers. This includes contracts for services involved in the operation of government-owned vessels.

Under the "peculiar situation" category, there are likewise three general types of cases. (a) When sup-

Tankers and troop transports will account for most of the new ships to be built under the new military program. Current plans call for 170 T2 tankers, such as shown here, to be built in the next three years

plies or services can be obtained from only one person or firm, competition simply does not exist. This situation prevails generally in public utilities where an area is served by only one company. It may prevail in a manufacturing field, as for example in the case of submarines for which there is but one private U. S. source of supply. (b) When competitive bids have been solicited in the formal manner and no acceptable bids have been received, it can be assumed that competition is non-existent. This will occur frequently in periods of short supply when commercial suppliers are not interested in government business. In order to secure a supply of needed items in this instance, the departments must have means of approaching individual concerns for the express purpose of obtaining an offer. Negotiation provides this means. (c) Competition is also impracticable when certain services, such as warehousing and stevedoring are either fixed by law or are so complex as to render it impracticable to set them forth in a formal bid.

The authority of this section of the law, though somewhat broader than prewar authorities, will be scrupulously policed by internal regulation within each department. Thus, rather stringent definitions have been prescribed for the guidance of military procurement personnel in their use of this authority.

(11) Research and Development: This is an exception for which the precedent dates only since the recent war. Public Law 588, which established the Office of Naval Research, contains a section which permits that office to award contracts after negotiation. Inclusion of this section simply extends substantially the same authority to the other military departments.

(12) Classified Items: Contracts involving the purchase of materials which have been classified "confidential" or higher may be negotiated if the situation warrants. In certain instances, in order to avoid compromising a military secret, the departments may find it necessary to go directly to the company which will supply the items or services involved. Negotiation is the local technique by which to consummate a contract in this case.

On the other hand, where several companies have been duly cleared for handling certain classified items, it is the intention of the services to "advertise" their proposals among those particular companies and encourage qualified companies to compete with each other for the business.

(13) Standardization: This is a new exception to the advertising procedure. The vast increase in the use of mechanized equipments and the great diversity of makes and models now available to the services have posed a difficult logistical problem within the military departments. A partial solution to this problem is to standardize on one, or a relatively few makes of these equipments.

Thus, when it has been determined by the secretary that standardization of equipment and interchangeability of parts is in the interests of national defense, i.e., it contributes measurably to the efficiency of the service, negotiation may be used for the purpose of contracting with the particular supplier of the item chosen.

This authority is to be used only for technical equipments and components, not common, off-the-shelf supplies. It will not be used for the initial purchase of a particular item, but only for additional or replacement purchases. The initial purchase will ordinarily be made through formal competitive bidding processes.

This means simply that if one of the departments wishes to standardize on a particular make of truck for reasons of economy and logistical efficiency, the initial supply of trucks must be obtained by formal competitive bidding procedures. If, then, it is desirable to standardize on the product of the successful competitive bidder, negotiation may be invoked in all future procurements of that item from that successful bidder.

(14) Initial Investment or Extended Preparation: This is another new exception to prewar procedures. This is a situation in which one company has performed a considerable amount of preliminary and preparatory work in connection with a particular item at government expense. When the item has been developed to the stage where it can be produced in commercial quantities, the company having completed all necessary preliminary work, such as tooling and training of personnel, holds a great advantage over any other possible producer. Any other manufacturer, in order to be able to produce the item satisfactorily, would have to make a substantial investment in tools and equipment and would have to spend considerable time developing such techniques as may be peculiar to the manufacture of the item.

The original producer, realizing this, may, under competitive bidding processes, submit a bid considerably higher than is justified in view of his advantageous position and still be a shade lower than the lowest of any other possible bidder.

Thus, the authority of this section of the law is inserted for the express purpose of permitting the government to take advantage of its own substantial investments in the development of a given item and ne-

Bulk of materiel funds in the expanded military program will go for research, development and procurement of aircraft. Shown above is Consolidated Vultee's XB-46, jet propelled bomber

gotiate a realistic price with the company which originally developed the item at government expense.

(15) Unreasonable Bids: The authority of this section will be invoked whenever it is determined that all bids received are unfair or unreasonable. If there is evidence of illegal collusion among suppliers or any violation of anti-trust laws, the departments are required to submit such evidence to the U. S. Attorney General.

Before a contract may be awarded under this authority, however, the department must reject all bids, notify each bidder of the government's intention to negotiate, must arrive at a negotiated price which is lower than the lowest competitive bid previously offered, and award the contract to that supplier whose negotiated price was lowest among the negotiating firms.

(16) Industrial Mobilization: This authority is perhaps one of the most important contributions to the maintenance of potentially critical industries. When the secretary determines that it is in the interest of national defense that any plant, mine, facility, producer, manufacturer or other supplier be made or kept available for furnishing supplies or services in the event of a national emergency, contracts may be awarded by negotiation for the specific purpose of maintaining the source of supply.

The single manufacturer of submarines is one example of this type of situation. There is no normal commercial outlet for submarines, nor is it in the interests of national security to permit the company to seek foreign outlets for its product.

Consequently, in order to maintain the equipment and techniques which have been built up in that company, it is essential that contracts be placed with the company to keep it going.

While this section appears to be an authority for outright subsidy, the use of such authority is amply protected by the requirement of a semi-annual report to Congress showing the manner and extent to which this authority has been invoked.

Manifestly it will be used sparingly and only in instances where the interests of national security will be served by such action.

(17) Otherwise Provided by Law: Certain statutes, which prior to the war recognized other exceptional cases requiring negotiation, have not been codified in or repealed by Public Law 413. Among these are such statutes as relate to construction work performed outside the continental limits of the U. S., architectural and engineering services, and services of experts and consultants.

It is important to realize that the use of negotiation under any one of the sections cited above relates not primarily to types of supplies but rather to the conditions under which any category of supplies may be procured.

It has been said that the military departments have been given *carte blanche* authority to buy anything it desires by negotiation. This is true only if the circumstances, as defined in the exceptions above, prevail. Obviously, for example, if certain common medical supplies or subsistence items can be obtained through normal sealed bidding procedures, negotiation cannot be justified and will not be available. The key, therefore, to the use of negotiation under Public Law 413 is in the particular set of circumstances surrounding the transaction involved.

In shifting from wartime to peacetime procedures it has been necessary to make the transition gradually in order properly to indoctrinate procurement officials in the processes of the new law. On November 1, 1947, the services voluntarily issued new regulations confining their purchasing to the terms of this bill in order to gain experience under it and to provide a preliminary training program under its provisions. Thus, when Public Law 413 becomes effective it will have the relatively unusual distinction of having been operative and applicable even prior to its becoming law. This is possible, of course, because it places restrictions on the broad authorities contained in the War Powers Acts. These special war powers, incidentally, will be inapplicable to military procurement as of May 19.

Sealed competitive bidding procedures are the general rule, negotiation is only the permissible exception. But it is of further significance to note that even the use of negotiation does not eliminate or in any way preclude the use of competition among potential suppliers. Negotiation simply provides a business-like method of making purchases when circumstances are such as to make firm unqualified bids impracticable.

Indeed, experience has shown that in many instances the negotiation technique has encouraged competition among interested bidders. When certain conditions prevail, as recognized in the above exceptional instances, many suppliers are willing and anxious to discuss terms

when the nature of the purchase makes it impossible to compete effectively by sealed bids.

Other Features

Another important feature of Public Law 413 is its recognition of the need for contracts other than the fixed price type. The cost-plus-a-percentage-cost system of contracting is specifically prohibited, but cost-plus-fixed fee contracts and incentive type contracts are permissible if such contracts are likely to be less costly than a fixed price agreement.

This, of course, is a natural auxiliary to the negotiation technique. It permits the government to tailor its contracts to fit the circumstances and still provide maximum advantage to both parties.

All negotiated contracts will be required to contain a warranty by the contractor that no third person or agency has been hired to secure such contract for a commission, percentage, contingent or brokerage fee. The exception to this provision is where bona fide employees or bona fide commercial or selling agencies are already established and maintained for the purpose of securing business in general.

Other features of the law relate to policies governing the use of advance payments, liquidated damages, and the maintenance of certain records relating to the administration of the law.

Section 10 of the law confers authority upon the secretaries to make certain delegations and enter into administrative agreements with respect to combined, joint, or single department procurement consistent with the spirit and intent of the National Security Act of 1947.

Responsibilities Under the Law

Perhaps the most important feature of Public Law 413 is the spirit behind the written words of the statute. It can be compared with the ownership of a new high-powered automobile.

The manufacturer guarantees that his car will accelerate to 100 miles per hour, but he urgently hopes his customers will not endanger their lives and others' by driving the car at that top speed.

And so it is with this new law. An instrument of tremendous power has been placed in the hands of the defense agencies. But it is not expected that they will exercise full power unless other means are inadequate and exceptional authority is essential.

Like the operation of a motor car, administration of this law imposes certain responsibilities which must be fulfilled. The use of this law can be judged on two standards, i.e. legal and ethical.

Legally, the authority is very broad, though the broader the grant of authority, the more specifically the law spells out safeguards to guarantee against abuses. It is granted to provide the military departments with all the procurement power they need to maintain a proper defense program. Ethically, the authority is somewhat narrower. The authorities as granted have not been given simply for the convenience of the government or industry. Rather they have been granted in recognition of certain extraordinary circumstances which demand an unusual method of procurement.

To the end that the ethical standards will be maintained, the law requires that the power of negotiation under exceptions (11) through (16) be invoked only upon written determinations signed by the secretary of the department. Thus, through the secretaries of the three departments, the burden of responsibility falls squarely upon those officials who will actually administer and operate under the law.

This includes not only the procurement personnel who must make and administer the contracts, but also the military strategists who determine the operational schedules, and the technical experts who determine the nature of the supplies and materials necessary to meet those schedules.

Legal expedients which have no basis in either efficiency or economy will have no place in the conduct of procurement functions under P.L. 413. The circumstances surrounding any given purchase transaction must genuinely require the use of special authorities contained in the law. Otherwise the services can easily open themselves to the criticism that they are employing unfair practices in their contracting functions.

On the other hand, businessmen too have a responsibility under the new law. It is of particular significance that much of what is contained in Public Law 413 is the result of the experience of businessmen in the service of their country during the recent war. Many of these men, whether in uniform or in civilian capacities, served as procurement officials in the armed forces and made a tremendous contribution toward modernizing government procurement practice.

The United States successfully concluded the last war not alone on the skill of its fighting men, but also upon the facility with which it was able to mobilize industry and get the implements of war to the men who needed them. This meant, simply, quick and sound buying. American businessmen, both in and out of the government, carried the big load on the home front.

Their responsibility today is to recognize the government's interest in preserving the kind of competition which characterizes the spirit of a democratic nation. Competition, full and free without discrimination, will continue to be the keynote under the new law, regardless of whether sealed written bids or informal proposals are solicited. Commercial men have long recognized the benefits of competition in the field of purchase. They normally encourage competition among their own potential suppliers, and they are willing to compete with their rivals in making a better product for less money and thereby secure more business.

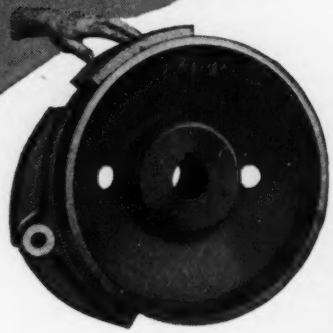
It has been this spirit of internal competition which has brought American industry to its number one position in the commercial world today. Consequently, there will be no justification for the supposition that competition among America's businessmen is a thing of the past in dealing with Uncle Sam. Public Law 413 was not devised as a measure of convenience but rather as a means of placing government purchasing on a businesslike basis.

Today industrialists may have much more confidence in the flexibility and practicality of Uncle Sam's contracting practices than they ever could prior to 1942. They will be asked to compete for the government's contracts, but when extraordinary circumstances make this impracticable, they may have confidence in the fact that the government can negotiate contracts which are mutually beneficial to both parties.

The defense agencies depend most heavily upon their civilian suppliers, hence interest in government contracts should never be allowed to wane for lack of a proper medium for equitable business relations. The Armed Services Procurement Act of 1947 provides one of the best means we have ever had for the maintenance of a sound government procurement system in support of our national security program.

Type WB Brake showing how the motor armature is easily lifted out. At top left is the handle-nut for compressing the spring when removing motor armature, changing brake shoes and for manual control.

Long Life Brakes for A-C and D-C Motors by EC&M

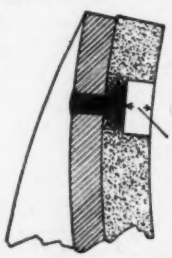


The brake lining is molded to match curvature of wheel and shoe.

These Type WB Brakes for a.c. and d.c. service have a block type lining which is both thick and tough.

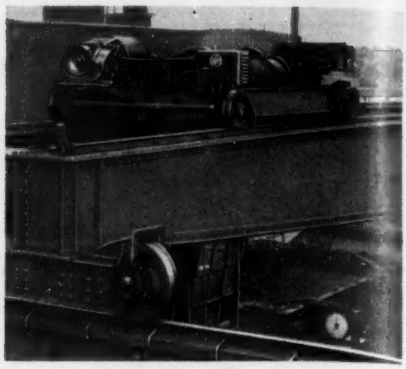
Furthermore, due to the process of manufacture, the blocks have proper frictional quality *throughout the entire thickness* permitting uniform and complete wear down to rivet heads. And since the material is non-compressionable, brake adjustments are infrequent.

EC&M Type WB Brakes are built in several sizes. They can be supplied with series or shunt-wound operating coils for direct current motors. On alternating current service, they are supplied in shunt-wound form for use with a compact rectifier-unit. Send for Bulletins 1004 and 1006 describing these long life brakes.

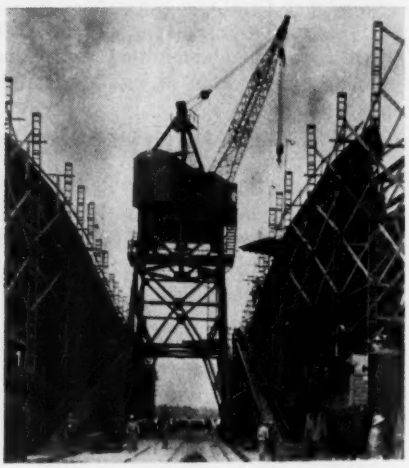


Actual wearing thickness, between rivet heads and brake wheel, is ⅛" on the smallest size to ½" on the largest size.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO



The A-c Brake Problem on this foundry crane has been solved. An EC&M Type WB Brake, operated from the compact rectifier-unit mounted to the right of the brake, has replaced the a-c brake previously used. The former 40 HP brake required renewal of brake linings as often as twice a week, and inspection to keep the brake in adjustment was frequent. The WB Brake operates with minimum attention. It is quick-responding too, because high initial operating current insures fast release; and automatic reduction in the holding current results in fast setting.



The propelling drive on this whirler crane is operated by four a-c motors, one on each leg. Keyed to the shaft of each motor is an EC&M Type WB Brake to hold the crane stationary not only when handling loads, but also to prevent movement by wind when the crane is not in use. An EC&M Magnetic Controlled of the quadruplex type, is used to start, accelerate or stop these four motors simultaneously . . . as smoothly as a single motor drive. On the rear of the controller is mounted a single rectifier-unit for power supply to the brakes on each leg of the crane. For cranes using only two motors on the bridge motion, similar control, but of the duplex type, is supplied for operation of the two motors and brakes. Bulletin 930 describes EC&M Control for a. c. cranes.

Engineering News . . . AT A GLANCE

PRODUCES PURE COBALT—In the detection of nickel impurities in cobalt produced by a new electrolytic method at Boulder City, Nev., the Bureau of Mines uses the spectrographic analysis method to turn out practically pure cobalt for use in high-speed steel and some essential military equipment. Technique consists of burning small samples of cobalt in an electric arc and photographing the light thrown on a film or photographic plate. Intensity of the various lines on the film is a measure of the composition of the material.

HIGH SPEED WELDING—Out on the West Coast, Norris Stamping & Mfg. Co. is making welding pay off in a big way so far as production joining is concerned. In one operation, for example, fastening of a stud to a stainlesss steel cooking utensil cover (0.025-in. thick), performance rate of a projection welder is about 500 pieces per hour. In another operation, a Taylor-Winfield seam welder is used to produce 143 seams per hour in joining a 20 gage skirt to an automatic washing machine.

INSPECTION "WITH MIRRORS"—To study riveting inside such structures as wing spars and flap tubes, Boeing Airplane Co.'s inspectors devised an instrument incorporating mirrors which in appearance looks like a 15-foot telescope. The pipe-like device includes a hole in the top of the "telescope" near the far end, and a mirror and light mounted beneath it, inside the tube. Light rays, shining up through the hole, illuminate the rivets so their reflection can be picked up by the mirror. At the tube's other end is a rifle 'scope that enables an inspector to look through the tube and get, from the mirror, a picture of the rivets.

"AIR" TENSION DOES IT—Coils of aluminum foil are kept wrinkle free as they pass into reducing rolls in the plant of Cochran Foil Co., Louisville, through use of a tension brake that operates on factory air line pressures. The brake, supplied by Linderman Devices Inc., New York, can be calibrated to the exact tension required by simply regulating air line pressure with the aid of a sight gage. Former method used to keep a tight tension on the aluminum as it was processed and caused frequent variations that led to repeated foil breakage.

FACILITATES SMALL PARTS MAKING—Small intricate parts for relays, meters, electronic equipment and compasses now can be made economically and with less brittleness with a material developed by the metallurgy division of General Electric Co., Pittsfield, Mass., as result of a new method of sintering its Alnico 5. The material is reported to provide unusually high tensile properties, and can be produced with smooth surfaces and close dimensional tolerances.

"SOUPED UP" FLAME HARDENING—Flame hardening operation on the roller pad of a lower frame casting used on power shovels built by Columbia Machinery & Engineering Corp., Hamilton, O., is now completed in a matter of 25 minutes through use of a special fixture for positioning and rotating the 3400-pound casting. The fixture, designed with the aid of Air Reduction Sales Co., rotates each casting at a speed of 7 inches per minute while two oxy-acetylene torches simultaneously flame harden both upper and lower faces of the roller rings to a depth of 3/32-inch.

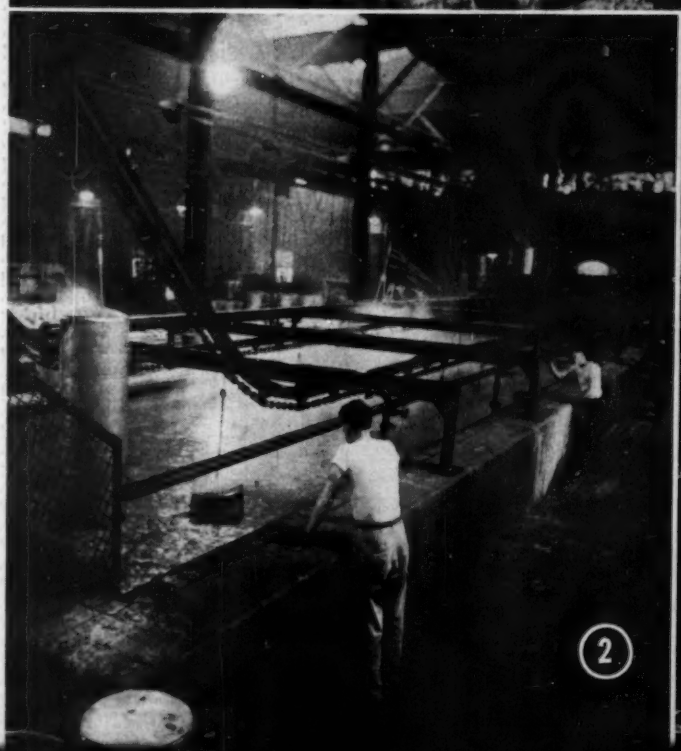
SMOOTH "SKIN" PROCESS—Tank components, introduced to the galvanizing kettle in the hot-dip process developed by Rheem Mfg. Co., are conducted through the bath in a smoothly-controlled manner with a very minimum of disturbance, and withdrawn at same rate of movement to provide even thicknesses of coatings. Heart of the automatic process is a conveyor system which may be operated at varying speeds, depending on nature of scale encountered on the work entering the pickle, and weight of the work. Latter condition is controlling factor in determining duration of the hot dip. (p. 76).

AIR-BORNE CHIPS— Several benefits are derived through use of pneumatic chip removal systems—espepecially in spots where chips are broken as they are produced, it is pointed out. These include a saving of manhours normally required to remove chips from individual machines, reduction in accidents incidental to handling thousands of small pieces of sharp metal and removal or separation of cutting oils from chips "on the fly" by the same blast of air that carries the chips. (p. 81)

NO "BACK-BREAKS"—Manual lifting of coils is completely eliminated by an overhead rail handling system installed recently at the Wire Rope Division of J & L at Muncy, Pa. The traveling overhead carriers, operating on a system of 18 rails, transport some 50 tons of wire in coils daily—jockeying them into proper production positions. Spotting of each wire loaded pallet is simplified by a pointer on top of each carrier and an indicator on the underside of the rail itself to show the operator the precise position to place each load. (p. 92)

SQUELCHES QUENCHING FIRES—Double-shot protection for the largest single hazard and multiple-shot "insurance" for others is provided by a 10-ton storage unit for low-temperature, low-pressure liquid carbon dioxide, used by a steel company in squelching fires in such places as forging quenching centers. System used is almost all-inclusive so far as covering hazardous locations are concerned—covering oil cooling towers, tranformer banks, oil storage, pump rooms as well as furnace basements. (p. 101)

Uniform Tank
1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By R. W. THRASHER
Rheem Mfg. Co.
New York

Coatings

Produced by Controlled Automatic Hot Dip Galvanizing Process

By a completely conveyorized setup, tank shell and head units and separate dome-shaped bottoms are hot dip galvanized, assembled and resistance welded. Relative concentration of zinc in and around weld area and other problems affecting efficiency of finished tanks were studied carefully to develop the highly successful fabricating methods followed

METHODS employed in the past in galvanizing fabricated objects have been relatively crude. Coatings have been nonuniform and of greatly variable thickness because of galvanizing kettle firing practices. Pickling practices necessary in the preparation of work for galvanizing have been haphazard and not subject to close control, and have been generally wasteful of materials and productive of inferior coatings.

Considerable manual labor of a particularly disagreeable and hazardous nature was involved in the older style of operations in and around the acid tanks and the galvanizing kettles, due to splash of corrosive acids and explosions in and under the surface of the flux and zinc in the galvanizing kettle. Such hazards are now completely eliminated in an automatic hot dip galvanizing process developed by Rheem, and superior coatings from the standpoint of quality have resulted.

Hot dip galvanizing plays a very important part in the protection of large quantities of steel and iron articles used in complex modern civilization. Approximately 626,000 tons of zinc were used in the United States in 1939, of which 44 per cent or 275,000 tons went into hot dip galvanizing of miscellaneous steel and iron products. This amount of zinc protected approximately 3½ million tons of ferrous products. It is estimated that premature corrosion and failure of iron and steel products in the United States costs the nation conservatively $6 billion annually.

Fig. 1 — Automatic galvanizing kettle, showing entrance end, flux dam and exit end. Galvanizing facilities here occupy an area of approximately 12,000 square feet and produce 4 to 5 million pounds of galvanized tanks per month

Fig. 2—This 68,000-gallon sulphuric acid tank is constructed of reinforced concrete with vitreous lining of acid-proof brick laid up in a sulphur base cement. Large capacity is used to avoid interruptions in the continuous process

Fig. 3—Upon leaving galvanizing kettle, work proceeds through cooling chamber and thence to this inspection point where it is brought down to floor level and inspected inside and out

Rheem Mfg. Co., producing a large variety of automatic water heaters in the gas, electric and oil fired fields, as well as a large tonnage of galvanized range boilers, pneumatic tanks, hot water storage tanks, water softener tanks and barrels, recognized that to improve the quality of the product a fully automatic system would have to be developed. All methods employed for hot dip galvanizing articles above described heretofore had employed the processing of the completed unit through the galvanizing kettle by manual means. After extensive study and experimentation, the company devised a method of automatically galvanizing and controlling the quality of the zinc coating on tanks.

It was discovered that to obtain a perfectly coated product, free of oxides and adhering fluxes, it would be necessary to galvanize units with one head welded into the shell or body of the tank and the bottom left out, thus providing optimum conditions for conveyorizing the entire operation with the principal benefits of being able to go through the galvanizing bath with a minimum of disturbance to the contents of the kettle and with a uniform rate of withdrawal.

Question then arose as to how the bottom end of the tank could be welded into place. During the initial development of this galvanizing method, no wholly satisfactory means of arc welding galvanized sheets was known. Considerable work had been done on tanks made from galvanized sheet welded by means of an arc rod, but such technique would in no way suffice for the quality of product that the company needs for the tanks in the appliances discussed here.

After further study, it was decided that the best hope of success, since these two matters are so intimately related, lay in producing the galvanized coating and assembling a bottom to a shell and head combination, both articles previously galvanized, and resistance welding the assembly.

With the decision to make the bottom resistance welding method standard practice, it became necessary to adopt as standard on most products a "minus" bottom, that is, one convex to the pressure. To keep stresses uniform in the design of the tanks, it then became necessary to use an increased design factor of one and two-thirds times the tank head thickness requirements.

Fortunately, in the hot dip galvanizing process, maximum economies in galvanizing seem to go hand in hand with practices that produce superior coatings. Dross formation in the galvanizing kettle is a good example. Dross is a compound of zinc and iron, roughly 4 per cent iron and 96 per cent zinc, and since it is of higher specific gravity than the balance of the bath, it settles out at the bottom of the kettle. Excess dross tends to produce rough coatings on the work being processed, and has other deleterious effects.

It has long been recognized that dross formation,

which is a direct loss in galvanizing, proceeds from a variety of causes, such as insoluble compounds remaining on the surface of the work due to improper pickling practices, faulty rinsing practices, the carrying of iron chlorides into the galvanizing bath from the fluxing tank, iron entering the bath from the kettle wall, and iron entering the bath from the work itself.

In the Rheem process, the tank is introduced to the galvanizing kettle with almost no disturbance to the molten bath. It is conducted through the bath in a smoothly controlled manner, and withdrawn at a uniform and controlled rate. These conditions are absolutely necessary to produce the uniform, controlled thickness galvanized coating on a tank and are impossible of attainment in any operation where the completely fabricated unit is galvanized.

Since all methods of galvanizing completed units tend to entrap quantities of the kettle flux in the interior of the tank, stir up dross in the kettle, increase the zinc oxide formation on the withdrawal end surface of the molten zinc bath, it can readily be seen that the regulation of the quality and uniformity of the finished coat is an impossibility.

In old hand-dip galvanizing practices as related to the galvanizing of articles of the type herein described, it has been common practice for as high as 42 per cent of the zinc spelter charged into the galvanizing kettle to find its way into dross and skimmings. It has been recognized that important economies and improvement in the quality of the zinc coating lay in part in a reduction of this figure.

An ideal galvanzing plant designed by the company's engineers on the basis of the conception described herein, was laid out and installed in the early part of 1941 at the Sparrows Point, Md., plant. After the war, this plant became a pilot shop from which numerous other installations over the country were patterned. Plants modeled after the original Sparrows Point pilot plant are in successful operation producing Rheem quality controlled, galvanized products in the Midwest, in the South, and on the West Coast.

Fig. 1 is a photograph of a galvanizing installation of the type described here. Galvanizing facilities occupy an area of approximately 12,000 square feet and produce 4 to 5 million pounds of galvanized tanks per month.

A continuous chain conveyor is utilized to carry the work through the various stations of the preparation and hot dip galvanizing processes. Black tanks enter the galvanizing room from the tank fabricating department and are processed through the galvanizing room and exit to a cooling chamber, inspection station, bottom welder and hydrostatic test department. All products entering the galvanizing room have been air tested as a subassembly and are known to be in perfect condition for galvanizing before entering. Heart of the automatic process is the conveyor system which may be operated at varying speeds, depending upon the nature of the scale encountered on the work entering the pickle, and on the weight of the work. This latter condition is the controlling factor in determining duration of the hot dip in the galvanizing kettle.

Sulphuric acid tank used in this installation is of the most modern design, constructed of reinforced concrete with a vitreous lining of acid-proof brick laid up in a sulphur base cement and having a capacity of approximately 68,000 gallons. This large capacity was decided upon to avoid interruptions in the continuous process. Interruptions would be encountered with a smaller tank in which the iron content would increase more rapidly. This tank is shown in a photograph, Fig. 2.

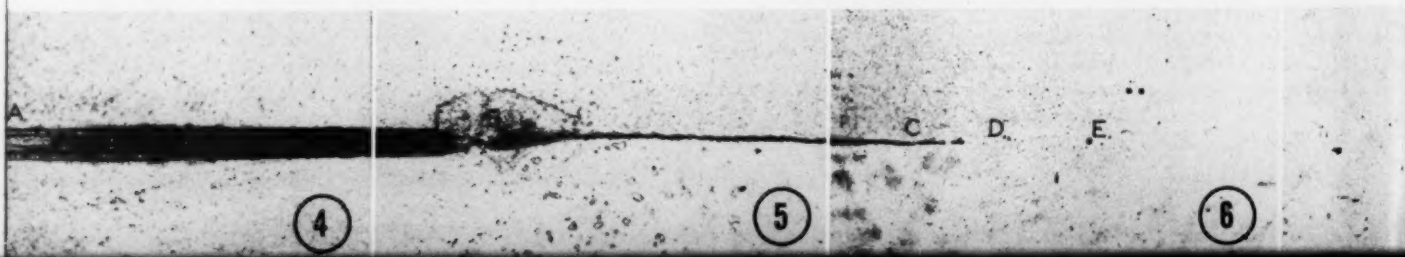
One of the most important factors in obtaining a high quality, uniformly deposited zinc coat is the condition of the steel surface presented at the kettle for the galvanizing action. Maintaining a fine balance is possible at all times in the acid tank between the elements of (a) immersion time, (b) temperature, and (c) acid concentration.

Pickling time in this tank depends upon condition of the product, temperature of the pickling solution and concentration of the sulphuric acid, the temperature of the solution being the predominant factor. The bath is started with a proper concentration acid with an addition of liquid proprietary inhibitor. Temperature of the bath is controlled by thermostatic valves and is gradually increased during the campaign of a batch of acid.

Vigorous agitation is secured during the pickling interval by introducing compressed air to the tank in such a manner as to insure a continuous wiping of the surfaces inside and out, thus removing any gaseous accumulation that might interfere with the proper acid contact with the work. Acid concentration may be decreased during this period. The bath may be continued in use until the iron sulphate concentration makes further acid additions uneconomical, at which time it is discarded.

Next the work is conveyed through a rinse chamber, where it is subjected to the vigorous scrubbing action of a water spray rinse under high pressure. This is accomplished preferably with hot water. It is important that all iron salts be removed from the surface of the work and occluded hydrogen driven off. This method of rinsing is superior, as evidenced by the superior coatings obtained.

Following the rinse chamber, the conveyor carries pickled and rinsed work into a muriatic acid flux dip tank. Construction of the tank is identical with the sulphuric acid tank previously described, but of 17,000 gallons capacity, being proportioned so as to give the proper ratio of pickling to fluxing time. Hot hydrochloric acid is used in this tank. The campaign of the bath in the tank is considerably longer than in the sulphuric acid tank, due to the



prior operations of pickling and rinsing performed on the work. The bath is discarded at the same iron build-up point as the sulphuric acid.

While the pickling action of hydrochloric acid is accelerated as the dissolved iron content rises, the harmful effects that are noted in the kettle, namely, the carrying in of ferrous and ferric chlorides to the zinc bath, with attendant accelerated dross formation, more than offset the loss in discarding the high iron HCL tank contents.

We come now, in the description of this process, to the galvanizing kettle which is the final step in the subassembly galvanizing process. Fig. 1 shows the entrance end of the galvanizing kettle with the work being conveyed through the flux blanket, as well as the exit end of the kettle showing the work being removed from the galvanizing bath. The conveyor speed and the precise slope of the rail at this point are critical, as the quality and distribution of the coating are determined to a large degree at this point.

Design of galvanizing kettle settings employed in most galvanizing installations of this type is the gas-fired impact burner type, firing onto a bed of refractory material, thence over a bridge wall to an exhaust flue and stack, the combustion rate being controlled by the most modern type of proportioning pyrometer. The controls also have the added feature of a single point "on and off" pyrometer connected in series with the controlling pyrometer set slightly above the maximum operating temperature as a protection against possible failure of the control instrument.

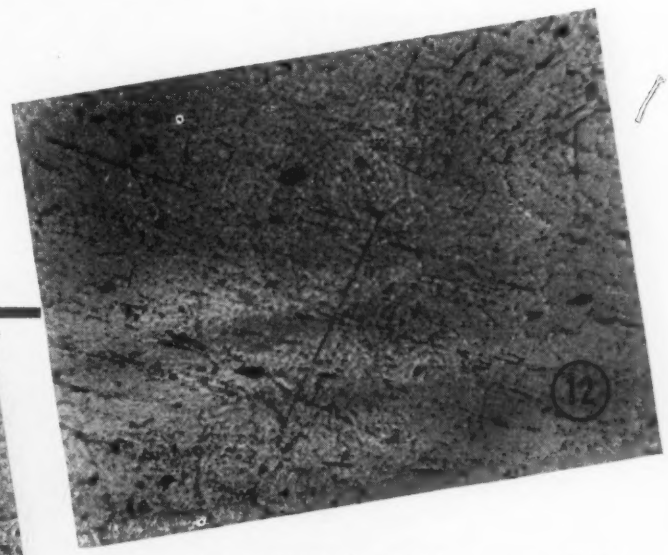
It will be seen in Fig. 1 that no difficulties are encountered in sinking the work in the galvanizing bath, due to the open end, made possible by the resistance bottom welding process. Most designs of galvanized tanks have $\frac{3}{4}$ or 1 inch openings only, and a very few of these. When galvanizing a completely fabricated unit, this results in difficulties in sinking the work, entrapment of flux on the interior of the container, explosions due to the superheating of moisture carried into the entrance end with attendant hazards to operating personnel. All of these difficulties have been overcome in the process described here.

An interesting point in connection with handling the product through the galvanizing kettle is the automatic dam for retaining flux on the entrance end. This is shown in Fig. 1 and consists merely of spring loaded hinged gates permitting the hanger rods to pass through the dam, which closes immediately after the rod has passed.

Referring again to Fig. 1 showing the exit end of the kettle, the zinc oxide formation on the surface is kept at a minimum by the proper alloying of the contents of the kettle. The alloy acts to form a very thin bright oxide surface for the molten zinc and minimizes the amount of oxide skimming necessary, promoting a smooth, bright finish coat.

Amount of oxide is also reduced in this process, since molten zinc does not splash from the holes of the container to the surface of the pot.

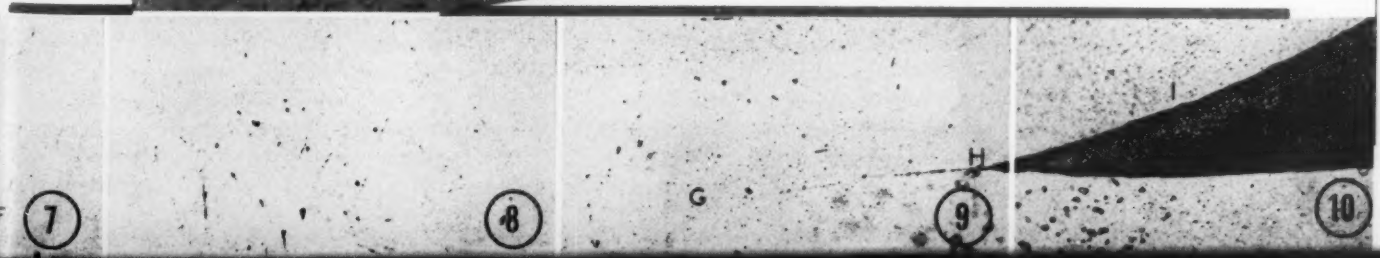
Rate of withdrawal, as has been mentioned above, controls to a large degree, thickness and the uniformity of the finished coat. This is accomplished by a balance between conveyor speeds and angle of inclination of the conveyor as the work emerges. No splashing of zinc occurs in this method of handling; the zinc "slips" uniformly down the sides, providing the ideal condition for coating thickness and uniformity necessary for product quality and for the resistance welded bottom.



Figs. 4 to 10—Photomicrographs across entire resistance weld area of a boiler taken from the production line, etched at magnification 50

Fig. 11—Enlargement of area G, Fig. 9. This is a photomicrograph at magnification 1000 and shows a cross section perpendicular to plane of the weld fusion joint near point G

Fig. 12—Enlargement of area at left of point G Fig. 9, at magnification 1000



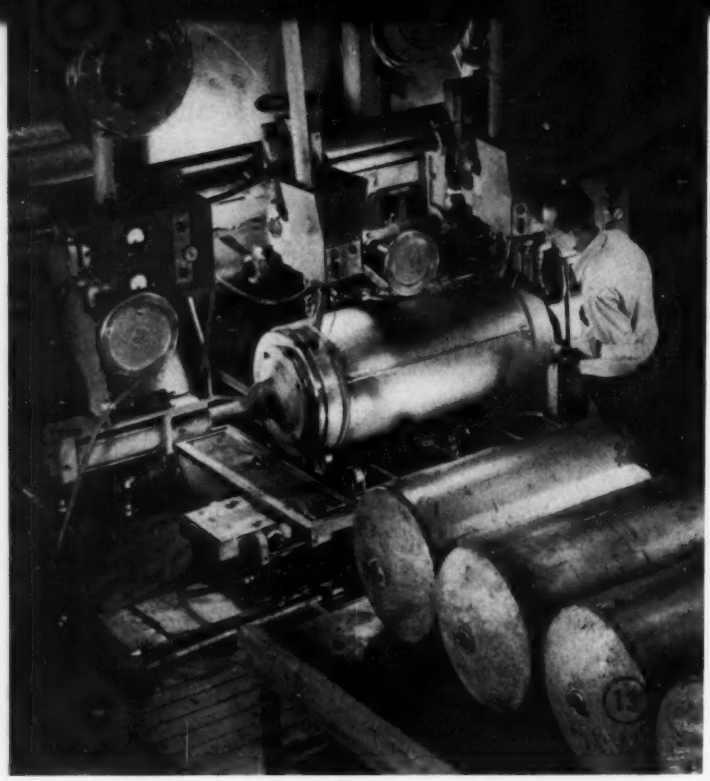


Fig. 13—Resistance bottom welder in action. Welding is accomplished by a pulsation method. Heat setting in the secondary varies from 60 to 90 per cent of transformer capacity, depending upon gage and material

Upon leaving the galvanizing kettle, the work proceeds through a cooling chamber and thence to the point of inspection. It is brought down to floor level and inspected inside and out. This inspection point is shown in Fig. 3.

To conclude this portion of the description, we call attention to the fact that all products thus far described have been galvanized as subassemblies, each one consisting of one head and shell or body processed as a unit. The bottom ends, as will be observed by reference to Fig. 1, are processed as separate units, and in the case of our series 30 and series 40 standard and de luxe model gas water heaters, series 10 and series 20 gas water heaters, and series 70 oil burning water heaters, the bottom and flue tube are processed as a subassembly to be later assembled and welded by the resistance welding process.

Work proceeding from the galvanizing room at the exit end of the kettle in Fig. 1 is carried by conveyor to a point in the bottom welding and hydrostatic test room where it is unloaded from the conveyor. Next step in the completion of the tank unit is the assembly of the bottom in its proper location prior to welding.

In the assembly of a standard range boiler, the bottom is assembled flush with the end of the shell prior to welding. In other products this varies somewhat, the bottom being assembled from 1 to 8 inches up in the shell, dependent upon the type of tank, that is, electric heater, gas water heater or oil water heater. The apparatus consists of a simple ram producing a forced fit between the shell and the bottom. This operation insures perfect roundness of the shell at the end and provides the close contact necessary for the subsequent resistance welding operation.

Fig. 13 shows a close-up view of a resistance welder in action. In general, these welds are performed on resistance seam welders equipped with full electronic synchronous controls. The welding is accomplished by a pulsation method. Heat setting in the secondary varies from 60 to 90 per cent of transformer capacity, dependent upon the gage and material. Surface speed of the welding electrodes likewise varies in relation to the gage and material being welded.

Control otherwise is completely automatic, the operator merely initiating the circuit and a timer cycling the operation through the squeeze, weld, overlap and release periods. Electrodes utilized in this welding process are continuously trimmed and cleaned at all times of any excess zinc that may be picked up due to the welding heat. The electrodes are flooded by a continuous stream of cold water to prevent heat travel and distortion of the work.

Resultant weld thus produced is sound and of high quality, spectrographic and metallographic examination showing only small amounts of zinc remaining in the weld and the zinc driven out of the fusion zone, perfectly distributed at the point of juncture of the shell and the inner bottom knuckle radius.

Figs. 4 to 10 inclusive are photomicrographs across the entire resistance weld area of a boiler taken from the production line, etched at magnification 50. It covers a narrow band in the weld area in a cross section from one of the samples. The series covers only the middle third of the total thickness of metal in the weld area, the top of the picture being toward the inside of the tank bottom and the bottom of the picture being toward the ouside of the heater shell. Point A represents the lower end of the specimen where it was cut circumferentially through the heater walls approximately $\frac{1}{8}$-inch below the lower end of the weld.

Opposite end of the picture, that is, the right hand edge of Fig. 10, is a circumferential cut just above the point where the bottom curves away from the outer shell above the weld. Dark speckled band between A and B represents the two original layers of galvanized zinc as blackened by the etching solution. The line of demarcation between the two layers of zinc galvanizing may be clearly seen toward the left. Darkened area surrounding point B is a stain resulting from etching fluid seeping out of a void. At point C there is still a line of demarcation between the two layers of zinc remaining on the surface of the steel, the coating having become very thin at this point.

Evidence of zinc layers disappears entirely at point D and the boundary line between the two steel sheets disappears at point E. Point F represents the center of the weld, this central point being located away from the plane of contact of the two steel surfaces. This apparently resulted from the higher heat flow from the outer electrode into the heater shell during the weld process. The oval shadow bands radiating from the center of the welds were doubtless caused by heating and cooling of the steel in this area. At point G the boundary line between the two steel sheets again becomes evident, increasing in width toward point H where some of the original zinc remains at the interface. (*Please turn to Page* 112)

PNEUMATIC Chip Conveying

. . . Centralizes Storage, Reduces Costs and Eliminates Accidents

By H. M. NICHOLS
Assistant Manager, Industrial Department
Sturtevant Division
Westinghouse Electric Corp.
Hyde Park, Mass.

System ideal for removing small chips directly from machines. Long curly chips or those containing heavy pieces must be processed before pickup by air system

AIR conveyors or so-called "blow pipe" systems have been standard practice in woodworking plants for quite a few years, but application of these principles to the handling of metal chips is of quite recent origin, although the advantages are comparable. Pneumatic metal chip conveyors naturally find their widest field of usefulness where nature of chips is such that they can be drawn directly from machines.

Long curly steel turnings and similar chips, as well as those containing heavy pieces of scrap metal must be manually removed from machines, crushed and possibly screened before being conveyed pneumatically. Even under these conditions pneumatic conveyors have the advantage of relative low initial cost, combined with a flexibility of installation, whereby all obstacles can be overcome without difficulty. All jobs are alike to the pneumatic chip conveyor; it will shoot the material around corners, up or down, anywhere pipe is laid.

Where steel turnings are to be removed pneumat-

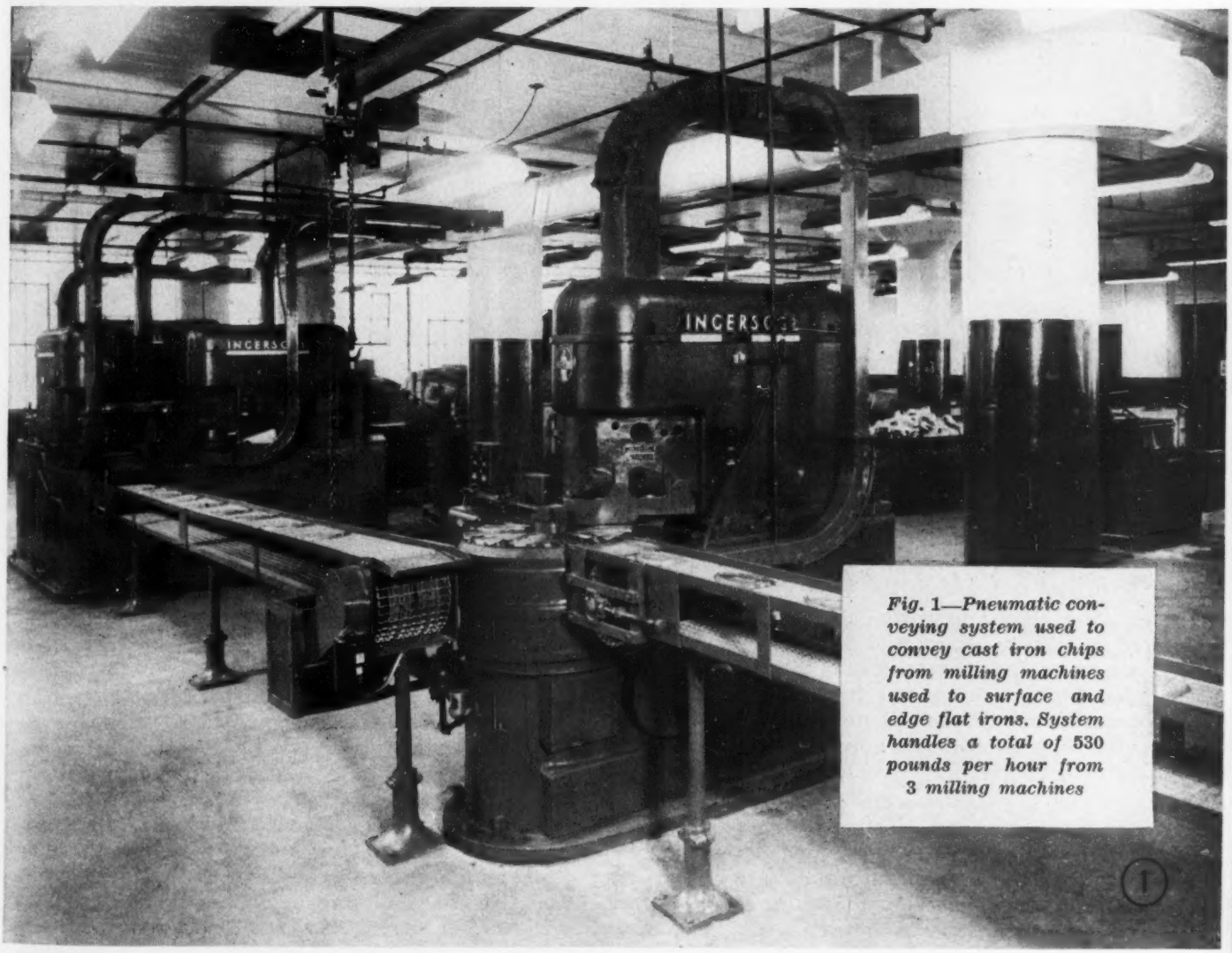


Fig. 1—Pneumatic conveying system used to convey cast iron chips from milling machines used to surface and edge flat irons. System handles a total of 530 pounds per hour from 3 milling machines

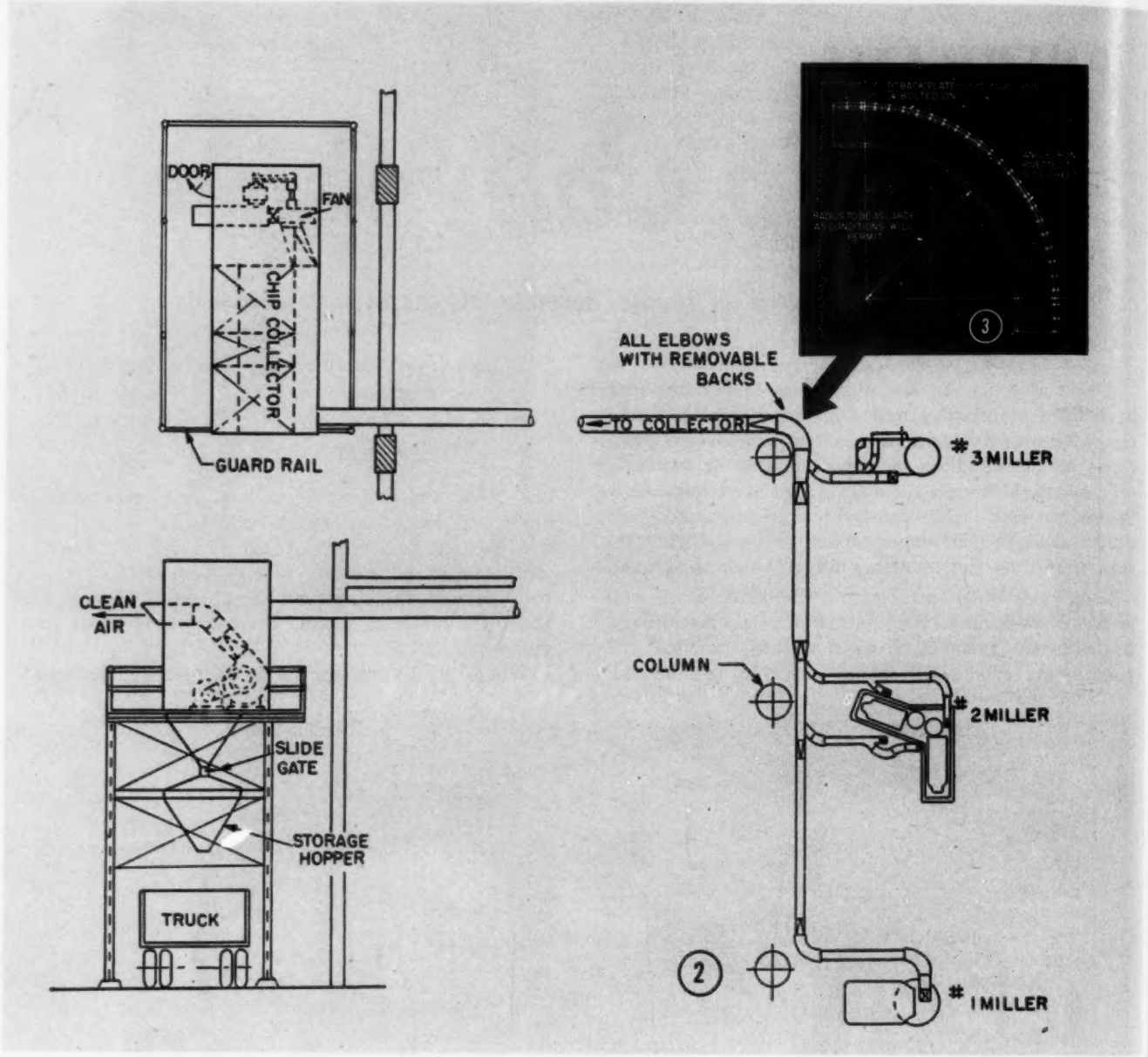


Fig. 2—Plan and elevation views of layout for cast iron removal system. No manual handling of chips is required from time they are cut until they are gravity loaded in truck

Fig. 3—Typical removable back elbow made of 12 gage black sheet steel has replaceable ¼-inch plates on wearing side

ically from the manufacturing space a common procedure is to collect the chips from the various machines in tapered metal boxes, holding around 6 to 8 cubic feet. Boxes are stackable and are transported on small fork trucks to a central operating station where they are dumped into a crusher and broken into small pieces. Surplus oil can be drained off, filtered and returned to the plant for reuse.

After being crushed the chips are fed to open end of a suction hopper and are conveyed by an air stream to final disposal point. Steel, brass, and similar chips which are free from dust are collected in conventional cyclone collectors, constructed of heavy black iron material and provided with wearing strips to compensate for abrasive action of chips.

Where the chips are broken as they are produced, conditions are ideal for the application of a pneumatic chip removal system. Advantages are: Saving of man-hours normally required to remove chips from individual machines, reduction in accidents incidental to handling of thousands of small pieces of sharp metal, and also where cutters are lubricated with oil same blast of air that gets rid of chips, draws off cutting oil fumes and smoke and discharges them out of doors.

Since there are many metalworking plants where the conditions are similar to those existing in the production milling department of an appliance manufacturer in New England, the recently installed pneumatic chip removal system shown in Figs. 1 and 2 is presented as a practical example of the application of conveying power of air in motion to a problem of this kind.

Gathering over two tons of cast iron chips a day by broom and truck was a costly and disagreeable

Lock made by the Norwalk Lock Co., South Norwalk, Conn., showing Revere extruded brass rod from which the handle is made.

IT IS significant that in the highly-competitive building hardware trade Revere Metals are extensively used to produce fine items. Take this Norwalk Lock and latch assembly. The escutcheon plate is stamped from sheet brass, Revere Alloy No. 160, known as Cartridge Brass, 70%. This has superior ductility, and takes a high polish.

The handle is made from extruded leaded brass rod, Revere Alloy No. 280, which is widely used for hardware, forgings, and plumbing goods. This is supplied in straight mill lengths, and the manufacturer cuts it to length, bends, machines and drills each end, and threads inside and out. After polishing he has, at low fabrication cost, a handle that is strong, solid, and whose beauty will endure through the years.

In manufacture of the tumbler lock, free-cutting brass rod, Revere Alloy No. 240, is used because of the ease and speed and accuracy with which it may be worked.

The Norwalk Lock Company states: "At this time we might place ourselves on record as recommending, wherever possible, the use of brass and bronze on our products to the hardware trade in preference to other cheaper metals."

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operation for this metalworking plant. Today a pneumatatic chip conveyor collects the chips as fast as they are made at the cutters and carries them through ducts to collectors outside the plant, where they are then discharged to storage bins. These storage bins are located so that a truck can be driven under each bin and loaded from gravity spouts of the bins.

Air supply for the motive power is furnished by a size 45 Planovane exhaust fan, V-belt driven by a 20 horsepower, 1800 revolutions per minute motor. Exhaust fan is rated to operate at 1425 revolutions per minute and delivers 6680 cubic feet of air per minute against a static resistance of 11.15 inches of water, requiring 19.6 net horsepower to drive. Cubic feet per minute rating is based on an air velocity of 5800 feet per minute in conveyor pipes and suction of 4 inches of water at cutter hoods.

Actual tests after installation showed suction at hoods was somewhat higher than this rating, as hoods were quite closely fitted to cutters, thereby increasing resistance at that point.

Pipes Have Cross Sectional Elbows

Conveyor pipe is made of 12-gage, welded black sheet steel and has rectangular cross sectional elbows with replaceable ¼-inch plates on the wearing side (outside circumference), Fig. 3. Ducts are provided with clean out slides at strategic points.

Cutter section hoods range in size from 4 x 5 inches to 8 x 8 inches as determined by the size of cutters and quantity of chips to be removed and are No. 12 gage welded black sheet steel. Design and construction of cutter exhaust hoods is extremely important since they are required to guide chips into suction pipes and prevent them from falling back into cutters or flying off into room.

In designing hoods of this type a basic principle to keep in mind is to shape and construct hoods, so far as possible, so that there will be no eddy currents. This can be accomplished by laying the hoods out, as far as possible, with the so-called "stream line" effect; i.e., sides of hoods should taper gradually to connecting pipes and also all abrupt bends and changes of direction within hoods should be avoided as much as possible.

Particular care must be taken to shape hoods so that the action of cutters will assist air currents by discharging chips in direction of flow of air and towards throat of hoods.

To be most effective hoods should fit cutter heads as snugly as posible without interfering with operation of machines, and also without unduly restricting opening for entrance of conveying air. Hoods must also be so arranged that they can be quickly swung out of the way for any necessary adjustment and removal of cutters.

As no standard exhaust hoods had been developed for the particular machines being hooded, and as it was practically impossible to lay out suitable hoods without studying their operation on the machines, light sheet metal hoods were first made and fitted to machines.

Blower system was then operated for short intervals and observations taken of functioning of hoods. Changes were made as indicated, to facilitate functioning of hoods and entrance of chips into hoods. When superintendent of the milling department was satisfied with operation of hoods, and that sufficient accessibility was provided to cutters, then the permanent hoods were constructed of the heavy 12-gage material, using the temporary light hoods as the patterns.

From machines the duct work leads to an outdoor separator which removes chips and cast iron dust from air stream, discharging chips and cast iron dust to storage bins and releasing exhausted air in a clean condition free from dust.

Separator has a preliminary classifier section which removes heavy chips. Light dust passes on to a cloth filter section where final separation is made. Screen filters are rated on the basis of 3 cubic feet of air per square foot of filter area. Inlet of the exhaust fan is attached directly to the clean air side of filters so that only cleaned air passes through fan wheel and housing.

Collector housing is heavily braced to withstand collapsing pressure created by the fan suction and all joints are calked with cement to prevent air leakage and short circuits.

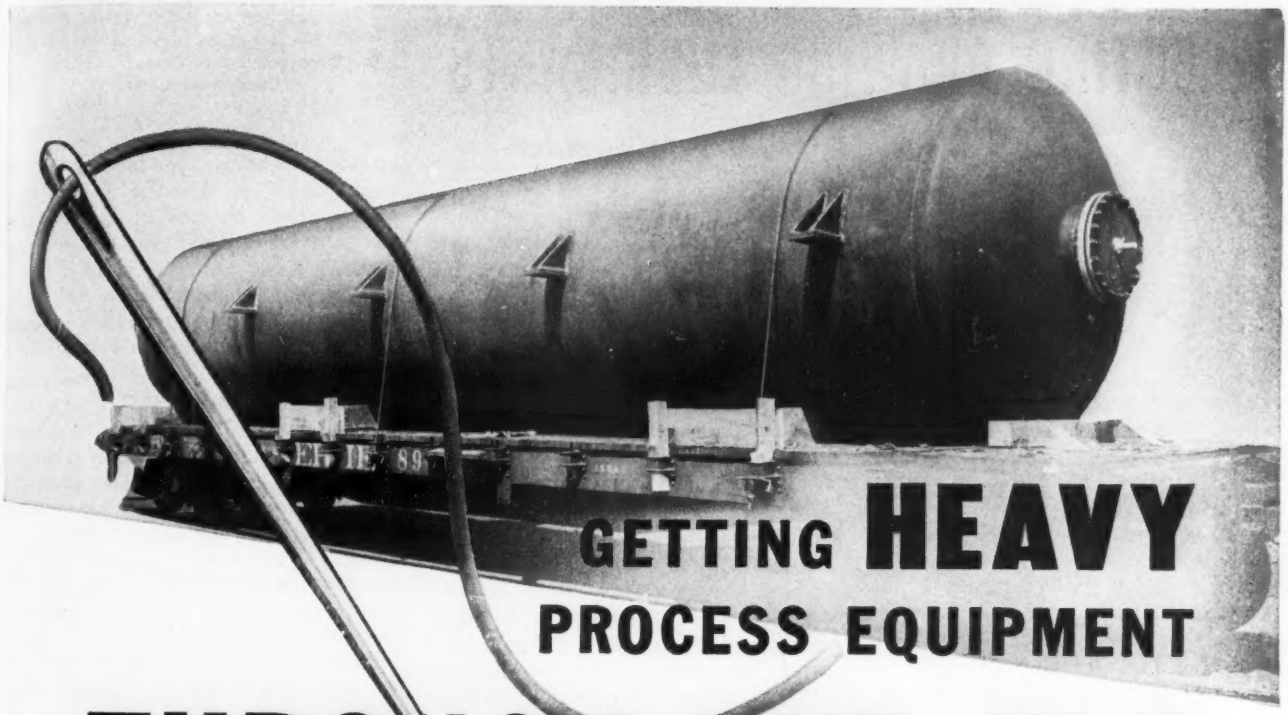
Collector is furnished with sloping hoppers for both classifier and dust sections. Each hopper is provided with a 6-inch cast iron slide gate at bottom, which in turn connects to storage hoppers, each 6 feet 3 inches by 7 feet 3 inches. The reason for additional storage hoppers is that collector hoppers must be kept free of accumulated material for satisfactory collector performance and material separation. Slide gates are open under normal operating conditions and are only closed during short intervals while chips and dust are being drawn into the collector hoppers from storage hoppers.

Equipment of Chip Removal System

Storage hoppers are constructed from 11-gage black sheet steel for bottom sections and 14-gage material for top sections. Collector, fan housing and supporting members are of heavy structural steel and in additon all large flat surfaces are stiffened with steel angles to resist collapsing effect of higher outside pressure.

In foregoing description of a pneumatic cast iron chip removal system it is apparent that greatest savings are obtained when condition of chips is such that they can be drawn directly from production machines. However, same principles apply to long curly chips, or chips which contain heavy pieces of metal, except that these chips must first be processed after they leave the machine before they are picked up by air system.

Most metal production plants still remove steel, brass, aluminum, cast iron, and other metal chips by broom and truck. This archaic method of removal is used in spite of the fact that where conditions are favorable a pneumatic chip removal system can produce savings equaling those possible in the woodworking industry where these systems have become standard procedure.



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SELECTING DRAWING LUBRICANTS

...Determining Factors To Consider

General aspects of drawing lubricants and how they function are of great importance to the pressed metal industry. Here, the author enumerates some of the many variables that should be considered in choosing drawing compounds

By W. J. HARING
Director of Metals Research
Quaker Chemical Products Corp.
Conshohocken, Pa.

RECOMMENDING a specific drawing compound for a particular job requires consideration of more properties than merely the ability to lubricate successfully the drawing operation. Best results are obtained when a field lubricating engineer considers all of the requirements of the job, and then uses the best type of compound to meet those requirements.

Field engineers enter the picture and find certain fixed factors. Design of the desired drawn part is already determined. The required draw may range from simple stamping to difficult ironing operations. Composition of the dies and of the metal is already determined as well as the type of press to be used.

Beyond these fixed factors are the many variables that should be considered. These are first, means of application of the compound. After application is decided by available equipment, the physical properties of the drawing compound are usually determined by method of application, but the chemical properties are not yet set. Currently, there is a trend toward the greater economy of spray application. In a recent case one fourth as much compound was required when dip application was replaced by spray application.

Chemical Composition — Chemical composition of the drawing compound is often determined by severity of drawing operation. Lubrication of a drawing operation differs from the familiar lubrication such as occurs in bearings. In a bearing, pressures are relatively low and motion is such that fairly thick films of oil separate the metal surfaces.

This is called viscous lubrication and obeys hydrodynamic laws. In drawing operations pressures must be high enough to deform the metal plastically. Under such pressure films become so thin that only a few layers of molecules remain to provide lubrication, this is called boundary lubrication.

Boundary Lubrication — Best way to understand boundary lubrication is to examine the surface of metals. The concern of the engineer lies almost entirely in the surface since the primary job is to keep the surface of the metal from merging with the surface of the tools.

Modern atomic theory gives us a picture of solids being composed of atoms and empty space. In crystalline solids, such as metals, these atoms are arranged on a regular periodic, three dimensional framework. Each atom attracts its neighbors and is attracted in turn, by its attractive fields. In the case of a surface, this mutual attraction is one sided. Surface atoms are left with unsatisfied attractive forces. As a consequence of a solid being immobile these surface atoms attract the nearest mobile particle which will, at least, partially satisfy their attractive forces. If two metal surfaces are allowed to get close enough together, they combine in a weld.

When a fresh metal surface is created by a mechanical operation, those atoms newly in the surface will combine with any material present. Steel as it comes into the shop is coated with those materials which were present when that surface was formed or materials accidently or deliberately added after its formation. Normally, oxides, water, pickling residues, rust inhibitors and miscellaneous soil are found. Any attempt to draw the metal with these materials on the surface, is usually a failure.

It becomes evident that not just any material on a surface will act as a boundary lubricant. Mineral oils which serve for ordinary viscous lubrication will not do the job. Fat and fatty acids will provide boundary lubrication. Here are some of the similarities and differences.

Mineral oils are substances which the chemist call hydrocarbons. They are structurally chains of carbon and hydrocarbon, formula I.

Chemically they are quite inert—that is to say they don't have much attraction for most substances. It is because of this lack of attraction that they slip over one another and other substances with considerable ease.

Fatty acids are similar to hydrocarbons in that they have a long hydrocarbon chain but differ in having an acidic group on one end, formula II.

This acidic group allows atoms to attach themselves to the metal surface. In fact they crowd in as closely as possible so that they form a layer —an oriented layer—since they actually stand perpendicular to the surface.

Result of this orientation is that the surface is now covered with a layer which viewed from the top is strictly hydrocarbon chains. These hydrocarbon chains retain their property of allowing other materials to slide past easily. The film differs from that of a mineral oil in that it is tightly anchored to the metal.

From experience it is learned that only those longer chain fatty acids

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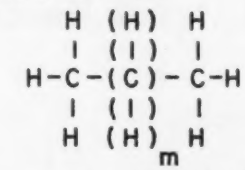

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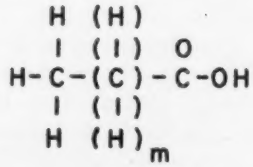

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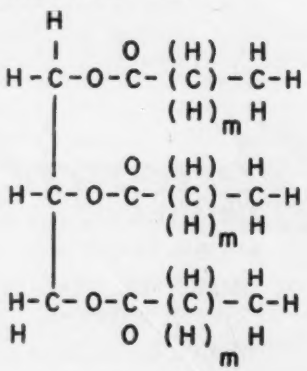

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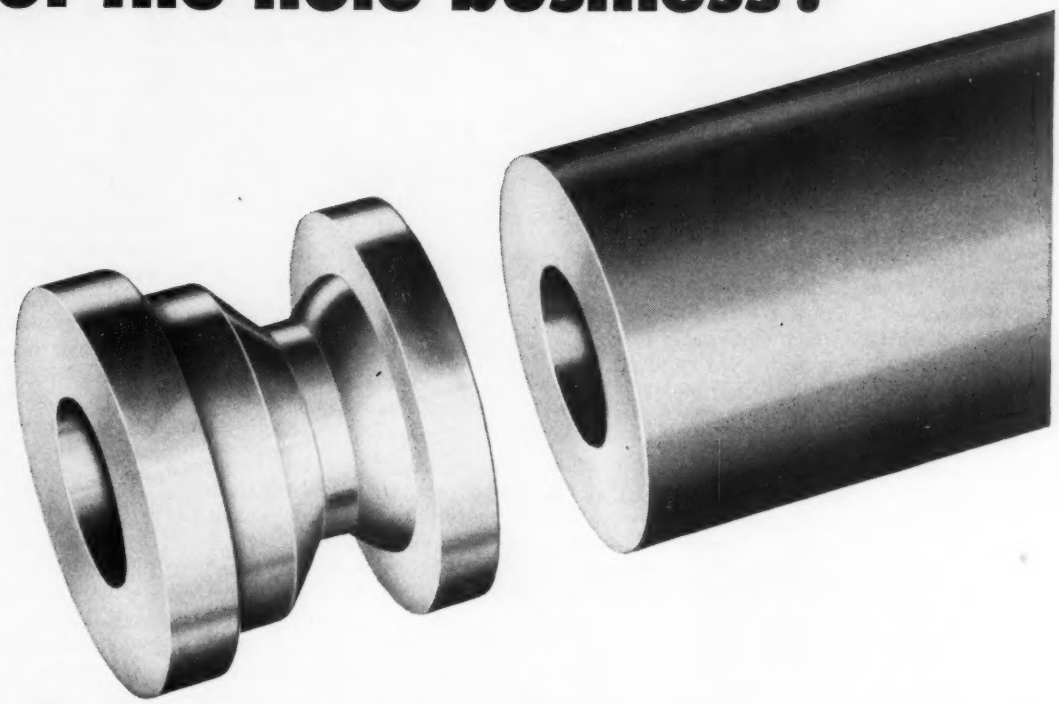

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which come from fats are useful to provide this boundary effect. This includes chains whose length varies from 10 to 18 carbon atoms.

Fats in general are composed of three fatty acid chains combined with a glycerine, formula III.

Practically any fat may be used for boundary lubrication. If no fatty acid is originally present the lubrication is not too good. After a short time free fatty acids appear and the lubrication improves. In drawing compound fat is used as a reserve supply source of fatty acids. Soaps also are materials which give boundary lubrication. This is normal since a soap is a combination of a metal and fatty acid, formula IV.

In water, soap splits into two particles, formula V. The fatty part is again held by the metal in an oriented film, the sodium iron remains in the water.

Fats and fatty acids are soluble in oil, not in water. Soaps are soluble in water. This is a means of providing lubrication water, although it is not so good as that provided by the fats and fatty acids.

In actual practice soap, oil and fatty acid are often combined so as to get a material which can be diluted with water and have the drawing properties of the oils. There are additional advantages to this combination. Presence of soap in water helps remove the normal contamination from the metal surface so that it is more certain to have the lubricant on the surface, not the soil.

Soap, fat, fatty acid type material pretty well illustrates the basic principles of boundary lubricant. Before consideration is given to what other materials might be used, it might be well to continue consideration of other properties of drawing compounds.

Next in sequence and next in importance is the cleanability of the drawing compound. Most cleaning operations are based upon exchange mechanism. Usual soil found on surfaces has not so strong a mutual attraction as does the surface and the cleaner. Under such conditions the surface is willing to release the soil in exchange for the cleaner. The released soil in turn is attracted and satisfied by the cleaner and the cycle is complete.

In securing boundary lubrication, compounds are used which are strongly held by the surface. It is difficult to effect exchange type cleaning with this type of soil since few cleaners have attraction for the surface. Solution to this problem lies in the ability chemically to alter the boundary layer to some material

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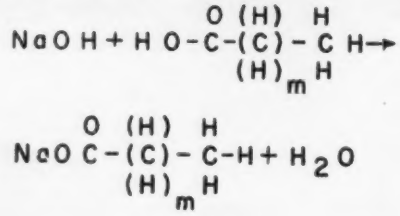

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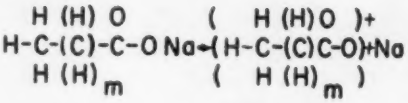


which is more easily removed.

Fatty acids and fats combine with alkaline materials to form soaps. These soaps are soluble in water and also act to emulsify unreacted oil. The fatty type lubricant becomes increasingly difficult to remove if inert mineral oils are present. In general, alkaline cleaners are adequate to remove fatty type drawing compound residues.

In some more difficult operations fatty lubricants do not provide the necessary film strength to prevent contact of metal surfaces. Additional separation is often provided by incorporating of a mineral powder. Chalk or clay are frequently used. Mica or graphite are less frequently used. These pigments assist by providing mechanical separation as well as reservoirs of lubricant. In turn they are made finer and firmly pressed into the surface by the drawing operation. Removal of pigmented fatty drawing compound usually requires the mechanical effects obtained in a spray washer using an alkaline cleaner.

Corrosion Related to Cleaning—In a sense, corrosion is closely related to cleaning. Practically without exception a material capable of providing boundary lubrication is capable of causing corrosion. In some types of drawing compounds the early removal of the drawing compound is a necessity. Fatty type drawing compounds are generally least corrosive and may actually act as corrosion preventives for short periods if storage conditions are favorable.

Operating principles of many corrosion preventives are quite similar to providing a boundary lubrication layer. The preventive forms a tightly held layer much like the boundary lubricant. Second requirement is that only that layer be formed and then action stopped. To accomplish this it is necessary that once formed, the layer be stable over a long period of time and not soluble in its surroundings.

Trick of increasing the lubricating properties of oils by the addition of sulphur is an old machine shop practice. From this start have come a host of combinations of sulphur. These compounds differ from one another in two major respects. Tightness of the binding between sulphur and oil varies greatly. It is weakest when the sulphur is merely dissolved in a mineral oil. Sulphur may be combined with fats so that it is very loosely bound or so tightly held that only at temperatures of 400 to 500° F is it available. In some oils it is so firmly held that it is not detectable until the oil is destroyed.

In any event, for the sulphur to be of use it must form the sulphide of the metal surface. These metallic sulphide layers are most effective in preventing the two metal surfaces from welding. The fact that welding is prevented does not mean that the two surfaces will slide over each other easily. Second difference between sulphurized oils now becomes apparent; that is the secondary properties incorporated to insure slip. Here again fatty oils held on the sulphide surface in an oriented film increase slip. Sulphurized materials may be combined with emulsifiers to give better cleanability or to enable them to be applied from a water solution. They may be used with pigments for the help mechanical separation gives.

Sulphide coatings formed may be so thin as to be undetectable visually or they may make the entire metal surface black. If the film does not interfere with subsequent processing, alkaline cleaners, emulsion cleaners, or vapor degreasers may be used. If the film of sulphide must be removed it can be done with an acid pickle or an anneal.

Sulphur compounds cause black stains and perhaps rust if uncleaned, and storage is unfavorable.

Chlorinated Compounds — Chlorinated compounds depend upon the formation of metal chloride films which prevent metal-to-metal contact. These compounds are quite active chemically and are capable of forming a boundary layer to enable drawing of stainless steels. They work well in conjunction with sulphurized oils. The two types should not be casually mixed. Result may be excessively corrosive.

Chlorinated compounds are applied from oils. Water solutions are unstable and become dangerously corrosive with age. This sensitivity to

water makes it necessary to clean before prolonged storage.

In a few cases metal coatings are used. Stainless tubing is drawn with lead coatings. Copper coatings are of value in severe ironing operations. These metallic coatings give some protection against rust. Cleaning requires that the surface be removed in an acid pickle.

Conversion of the metal surface to the phosphate—such as Parkerize or Bonderize—acts to provide a pigmented surface which aids the lubricant by providing mechanical separation in addition to better anchorage for the lubricant.

Future of drawing lubricants is difficult to predict at this time. Most present lubricants lean heavily upon fatty components. Fats are expensive and not too plentiful. There is increasing use of more efficient application methods such as spray or roller application.

Dry film types are gaining wider acceptance. Their cleanliness makes them psychologically acceptable. With this type coating it is possible to build up banks of parts. Probably most development and increased use will occur in this type. The resin type materials will probably remain expensive so water soluble types will see most gains.

For some limited uses, it is possible to coat the steel at the plant with a coating which gives protection against mechanical damage and corrosion. These coatings are usable to lubricate some drawing operation. Such coatings have much development ahead of them before they become common.

From data presented by the author at the New England district meeting of the Pressed Metal Institute, Jan. 13, 1948.

Chromatic Protein Films Inhibit Corrosion

Convenient inexpensive means of protecting metals, especially zinc, iron, brass and aluminum, during outdoor storage in mildly corrosive atmospheres with chromated protein coatings have been developed by technicians of National Bureau of Standards, Washington. Metallic surface to be coated is first dipped in casein, albumin, or gelatin and the resultant film is then impregnated with chromate which both hardens the film and inhibits corrosion.

Protective film can be applied in a single step or several steps according to compatibility of the agents and degree of protection desired. In two step process which is usually most satisfactory, metal is first dipped into an aqueous protein solution and allowed to dry. Then it is immersed in an acidified chromate solution for ½ to 3 minutes and allowed to dry without rinsing. Film may be removed from metal by application of an alkaline solution such as 5 per cent sodium hydroxide.

Faulty Loading Practices Cause Container Damage

Failure of shippers to block doorways causes severe damage to fiber shipping containers according to a study made recently by Shipping Container Institute, New York. Doorways should be blocked in order to prevent containers from slipping into the few inches of extra width in freight car doorways. Projections on the heavy doors cause damage when they are slid open.

Wooden framework or steel straps spaced closer together than dimensions of boxes should be fitted into the recess to take up this space. Care should be taken to see that boxes are protected from contact with ends of boards or straps by means of sheets of corrugated fiber.

Weak and insufficient bracing, along with total lack of bracing and partitioning in stop-over cars are also major factors in damage to packaged freight. Use of weak slats is usually a waste of time and sometimes results in additional damage caused by the damaged brace.

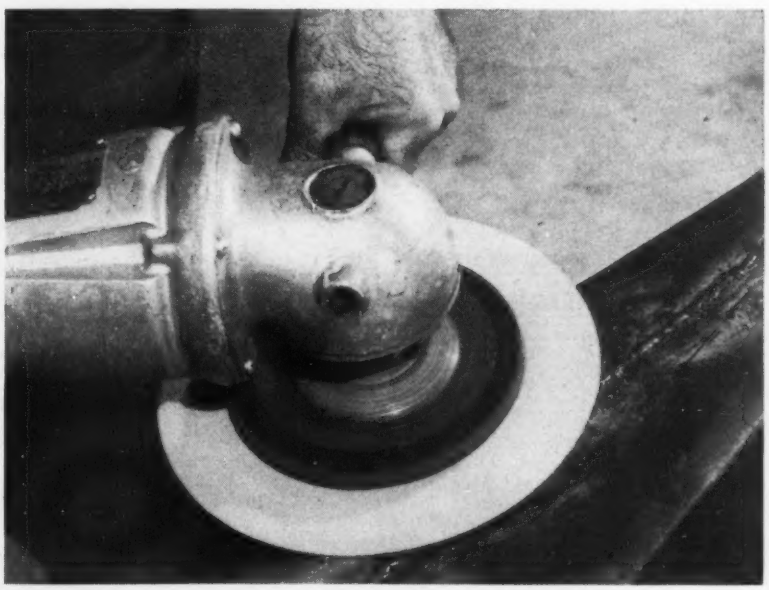
Grinding Safety

. . . enhanced by wheel flexibility

RECOGNIZING the growing need for improved safety in cutting off, straight and contour cutting and finishing operations, Bay State Abrasive Products Co., Westboro, Mass., recently developed a new laminated type flexible grinding wheel which promises to have many uses, particularly in the nonferrous metals industry. It is designed to cut, grind, burr or finish practically any of the heavy or light-gage sheet metals.

According to company engineers, increased flexibility, resilience and free cutting qualities are the result of combining aluminum oxide abrasive with cotton fibers. Degree of resilience is determined by the particular combination of abrasive, bond and wheel dimensions. Flexibility enables the wheel to cut on its side as well as on the periphery or edge.

Used without coolants, the so-called Bayflex wheels operate at speeds up to 9500 surface feet per minute; recommended speeds for raised hub disk wheels are 4000 to 5500 revolutions per minute for the 9 inch disk and 5000 to 7000 revolutions per minute for a 7-inch disk. The accompanying photograph shows one of the wheels smoothing a weld.



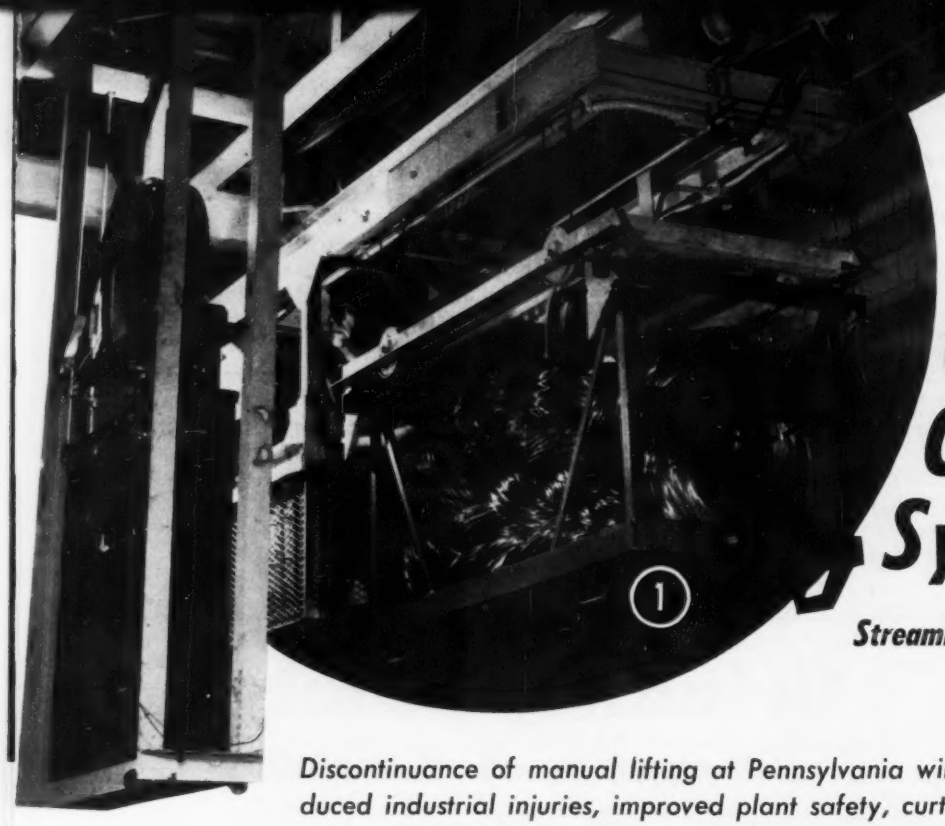


Fig. 1—Incoming wire coils are weighed on overhead scale which prints net weight on inventory card

Overhead Carrier System

Streamlines Material Flow at J & L's Wire Plant

Discontinuance of manual lifting at Pennsylvania wire mill has greatly reduced industrial injuries, improved plant safety, curtailed production stoppages at stranding machines and increased production. Details of unique system are presented herewith

OVERHEAD rail system for materials handling recently installed at the Wire Rope Division, Jones & Laughlin Steel Corp., Muncy, Pa., is not only effecting savings in time and labor, but is also resulting in increased safety and improved quality of production. With the construction of a new warehouse and installation by American Monorail Co., of travelling overhead carriers operating on a system of 18 rails, all manual lifting of coils within the plant has been eliminated.

Daily at the plant some 50 tons of wire in coils—1000 tons per month—are unloaded from freight cars and stockpiled in pallets three tiers high systematically arranged in 20,000 square feet of warehouse storage space. These pallets of wire coils are again carried by the overhead carrier to the winding department according to production requirements. Continuous flow of material during production is maintained by rolling the bobbins from the delivery end to the entry end of the next production unit until the finished reel of wire rope is finally rolled into the freight car or truck for shipment.

Wire arrives at the Muncy plant in varying sizes from 0.0058 to 0.205-inch diameter, wound in coils from 8 to 22 inches diameter depending upon size of the wire. Quality of this wire ranges from iron to improved plow in all grades, either bright or galvanized finish. It emerges from the plant in the form of wire rope varying in size from 1/32-inch used in sash cord and aircraft control cables, to 3-inch rope used for excavating drag lines and giant ship hawsers.

Coils arrive at the entry end of the warehouse packed in freight cars. Coil weights average about 150 pounds. They are lifted from the car by an unloader using a portable jib crane with an electric hoist motor, and "nested" into the pallets or "wire boats." These boats are of 30 cubic foot capacity and will carry a load of over 4000 pounds. The loaded boat is carried from the car to a spotting line or "landing strip" by a pallet truck, and positioned so that it can be lifted by the overhead carrier without assistance. From this point to the winding department where production begins, the operation is a one-man job entirely controlled from the cab of the carrier by the wire stocker.

The carrier lifts the boat and

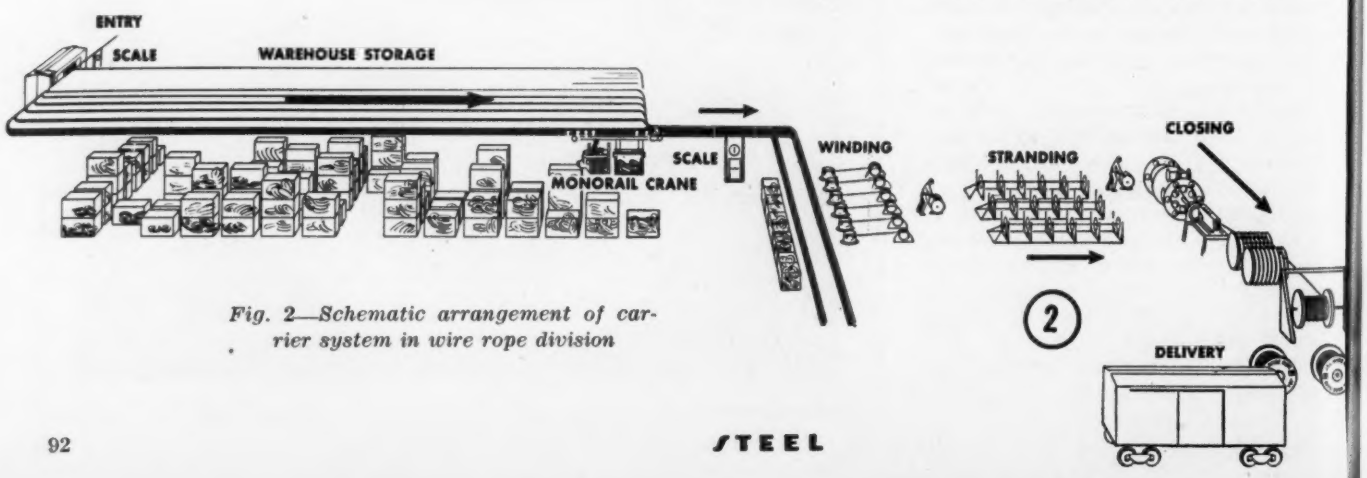
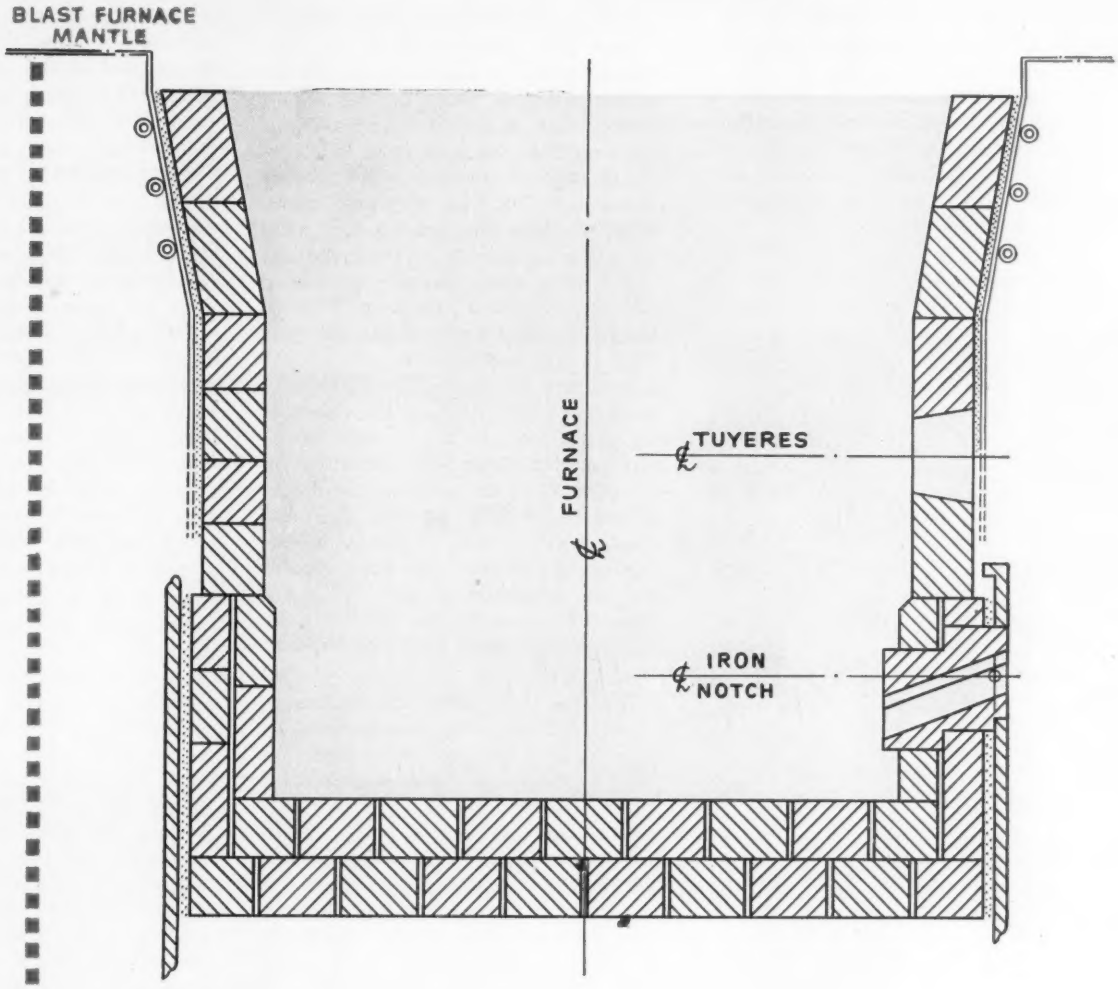


Fig. 2—Schematic arrangement of carrier system in wire rope division



Line it up to the mantle... with "National" Carbon

"National" carbon blocks have become the standard material for blast-furnace linings, for iron notches and cinder notches. And now, for real economy and efficiency, the trend in design takes the carbon-block lining up to the mantle.

Here are the reasons:

1. "National" carbon blocks last indefinitely. They have no melting point . . . are highly resistant to slag attack and thermal shock . . . are not wet by molten metal . . . have low thermal expansion . . . and maintain their mechanical strength at high temperatures.

2. "National" carbon blocks are easy to install. One carbon block takes the place of from 50 to 1000 nine-inch firebrick, depending on the size of the block. This means fewer joints, sounder joints, faster installation, and lower cost.

For more information on the use of "National" carbon blocks in blast furnaces, write to National Carbon Company, Inc., Dept. S.

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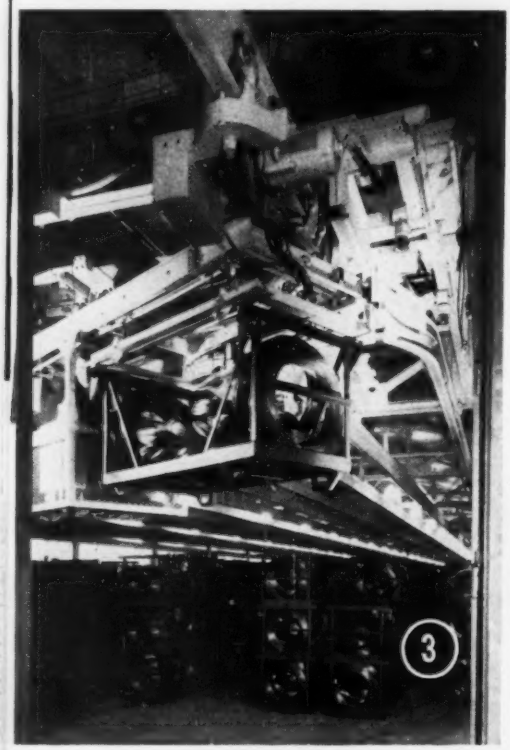
moves to a scale where the net tonnage of wire is weighed. Automatically compensated is the weight of the 2800-pound carrier, the weight of the 260-pound pallet, and the weight of the wire stocker taken daily and adjusted by a "poise" counterbalance on the scale. The scale also prints the weight on the inventory card used to record the size, quality and number of coils of wire, the date received, and the boat number.



Size and quality enables the carrier operator to spot the correct location for the boat in the warehouse. Each of the 18 rails travelling the length of the warehouse is lettered. In addition the warehouse is measured off into 50 stacking rows. With the size and quality for reference, the stocker determines the rail letter designation and the number of the row in which the boat is to be stacked from a chart of the rail system in his carrier cab.

Switches at each end of the overhead rail system enable the operator to move his carrier directly above the position where the pallet is to be placed. This location is determined, of course, by the size and quality of the wire. A pointer on the top of the carrier, and an indicator on the underside of the rail itself show the operator the precise position for the pallet to be lowered or lifted.

Material flow from the warehouse to the winding reels is scheduled by the winding foreman who gives the wire stocker his requirements on a ticket indicating the wire size and quality and number of pallets needed. According to these requirements, the stocker carries pallets from the stacks in the warehouse to the winding reels on the production floor. Coils again are weighed at the winding department to determine the tonnage in production.

From the winding machines bobbins are rolled to stranding machines. The strands wound on other bobbins are rolled to the closing machines, and as the finished wire rope comes off in reels, the reels are rolled directly into warehouse stock or onto freight cars or trucks at the delivery entrance for shipment.

The new warehouse is appealingly designed with brick tile walls and large glass brick windows. The interior color scheme is in keeping with the modernistic application of colordynamics decorating the production units — in sun-tone yellow and foam green. Its construction has made some 20,000 square feet of space formerly used for stockpiling wire, available for additional production units. In addition, the location of all wire stockpiles have been centralized and systemized.

The monorail system has streamlined the flow of material for maximum speed and efficiency with a minimum of labor requirements. In fact, labor requirements have been reduced more than 50 per cent and the personnel involved has been absorbed into more productive jobs. With the discontinuance of manual lifting, industrial injuries such as rupture and back strains have been almost completely eliminated and plant safety has been improved. Manual lifting of coils also frequently resulted in wire kinks and other damage to the wire, which later caused production stoppages on the stranding machines. These stoppages have been reduced, effecting an increase in production and quality.

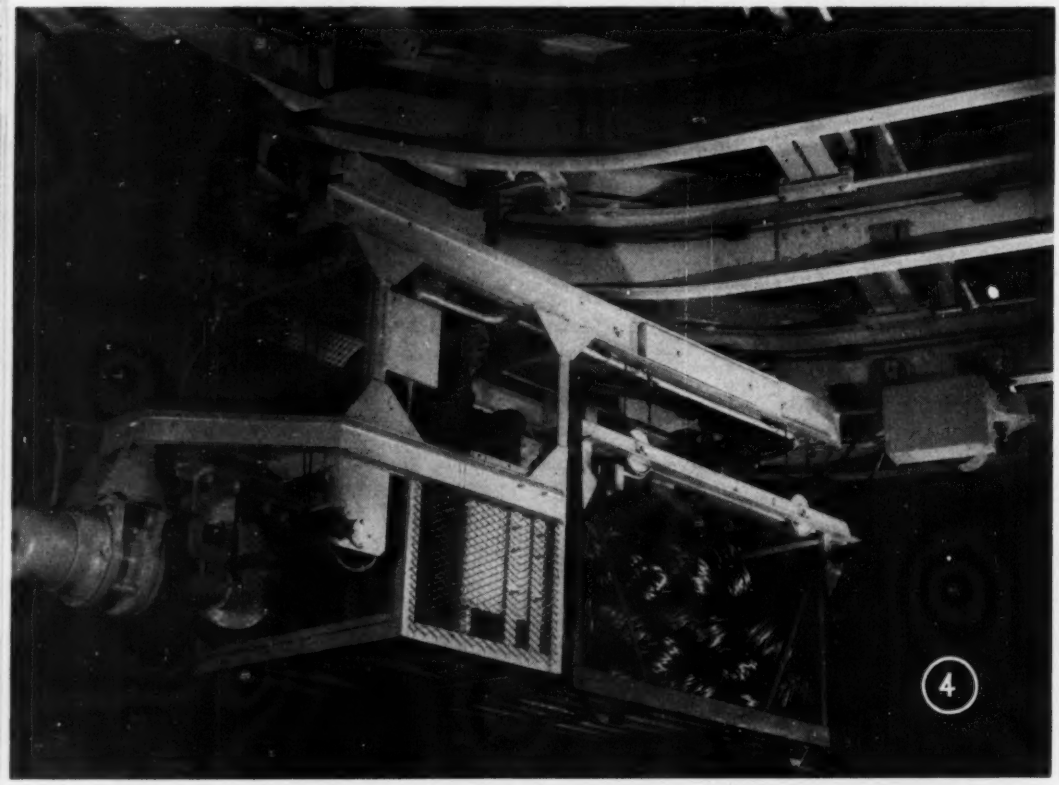


Fig. 3 — Pallets of wire are carried from warehouse into the winding department

Fig. 4 — System has 18 parallel overhead rails with switching arrangements at both ends of warehouse

For 33% More Units Per Ton

with equivalent steel tonnage

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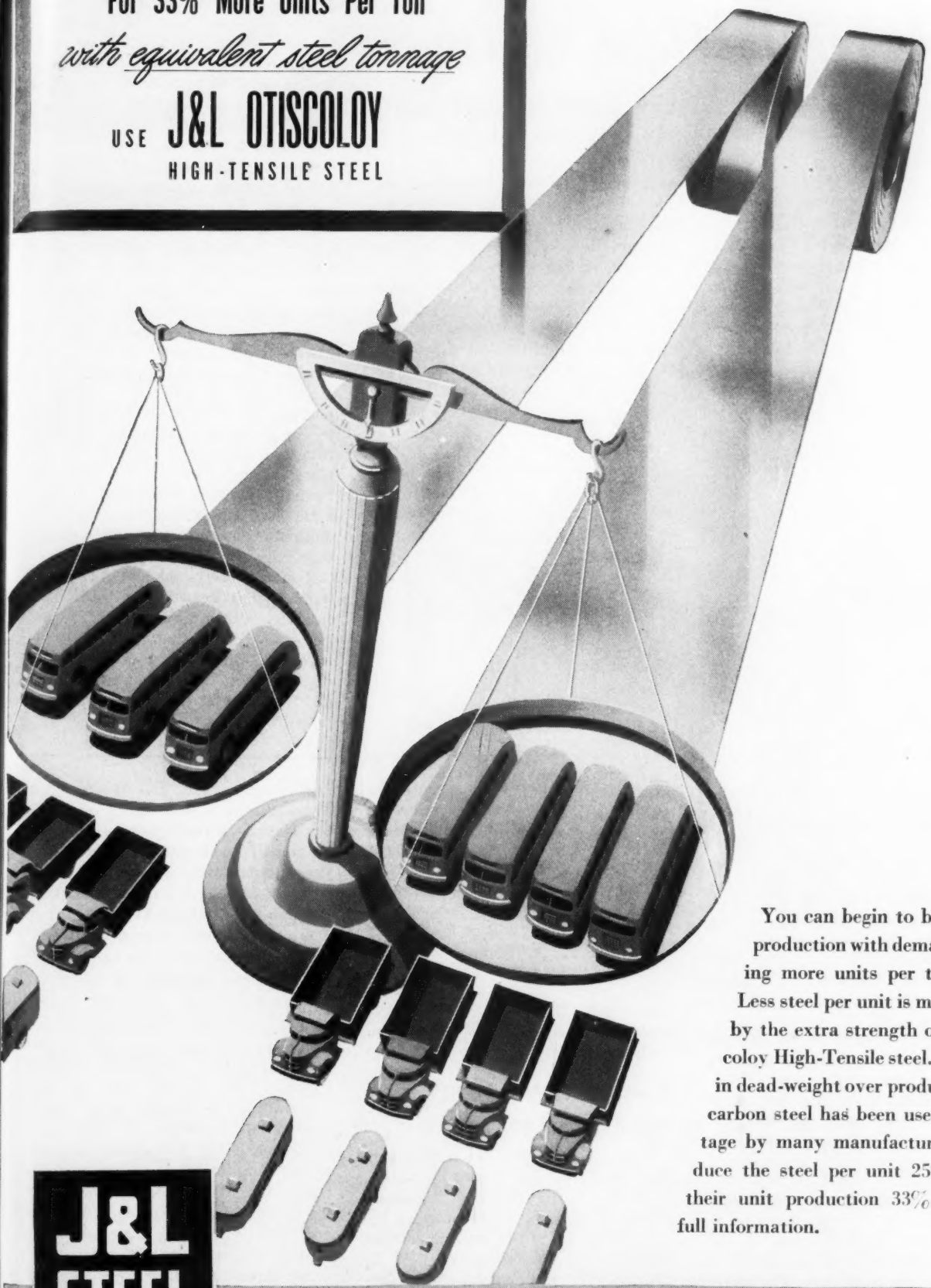
HIGH-TENSILE STEEL



You can begin to balance your production with demand by making more units per ton of steel. Less steel per unit is made possible by the extra strength of J&L Otiscoloy High-Tensile steel. This saving in dead-weight over products made of carbon steel has been used to advantage by many manufacturers who reduce the steel per unit 25%, increase their unit production 33%. Write for full information.

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PITTSBURGH 30, PENNSYLVANIA

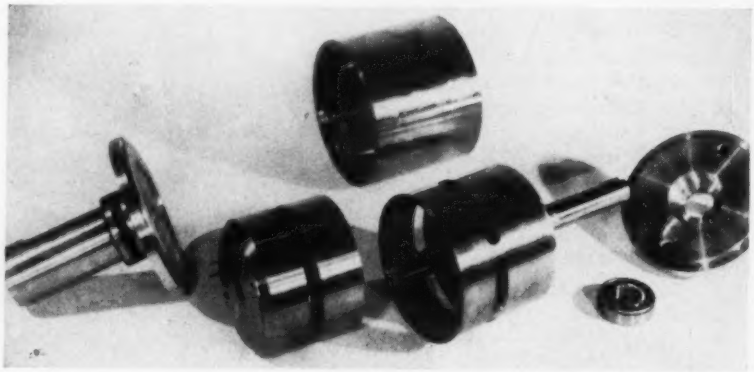
Development of

Magnetic Fluid Clutch

. . . provides smoother control for machines, servo-mechanisms and automobiles

CHARACTERISTICS of the new electro-magnetic fluid clutch invented by Jacob Rabinow of National Bureau of Standards, Washington, are high efficiency, smooth operation, long life and simplicity of construction with small amounts of electric power needed for control. Clutch is based on the discovery by the inventor that frictional forces between solid surfaces and certain types of fluid media can be controlled by application of magnetic fields. Of major interest to industry are uses of the clutch in automatic control of machinery as in drilling and tapping operations and for overload devices.

Simplest magnetic clutch is made up of three elements: A driving shaft with a plate at its end, a driven shaft and plate, and literally millions of fine iron particles which are suspended in oil and packed between inner surfaces of the two plates. When a magnetic field is established between the two plates, iron particles form chains which bind plates tightly together. Since locking force is practically constant and bond between the two plates is a function of gradual increase of the electrically controlled magnetic field, there is no chatter and no point at which the clutch suddenly tightens up to produce a jerk.



Some possible applications of the new clutch are in servo-mechanisms, automatic control of machinery, automobiles and many other fields where ease of control and stability from low to very high speeds are important. In the accompanying illustration is an exploded view of clutch showing the outer shell at the top and from left to right: Driving shaft, attached to end plate which is normally bolted to outer shell; coil and pole pieces, which are normally bolted to end plate; inner member, attached to driven shaft; and bearing and end plate through which driven shaft extends. Principles of the electro-magnetic fluid clutch can be adapted to design of brakes with equal advantage.

Results of tests conducted thus far indicate that wear is practically nonexistant although insufficient time has passed to rule out this factor altogether. Small amounts of wear as might occur, however, will simply add to supply of iron particles mixed in with the oil.

New Method Facilitates Stainless Steel Brazing

Development of a new brazing technique by research laboratories of General Electric Co., Schentectady, N. Y., makes possible joining of precision high temperature stainless steel parts. Furnace brazing of metal parts by melting a metal such as copper into the joints of heat resistant alloys containing chromium necessary in construction of jet engines and rockets was extremely difficult prior to this process.

Former methods resulted in oxidation of the chromium in fluxless brazing because of moisture or oxygen present in furnace atmosphere. When flux was used the cost of removing flux deposits afterwards was excessive and process was time consuming.

In the new process parts to be brazed are sealed in a box which is then filled with hydrogen. Copper is placed adjacent to the joints to be bonded and it creeps into the joints when molten. Box is placed into heating chamber of an electric furnace for 20 minutes to an hour and is then allowed to cool. Hydrogen which is explosive when mixed with air is exhausted and replaced with nitrogen before removing box from cooling chamber.

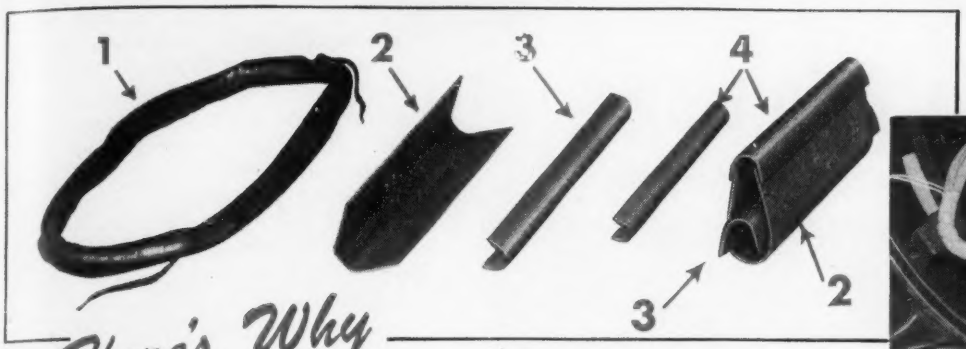
Furnace brazing of assemblies is sometimes used as an alternative to more common forming or fabricating methods with resulting reductions in machining time and waste metal. Intricate assemblies can sometimes be fabricated which could not be made any other way and still obtain the quality and results needed.

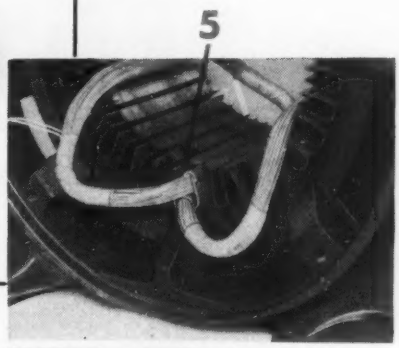
Specification Changes Announced for Steels

New specifications for carbon and alloy steels are announced by American Society for Testing Materials, Philadelphia, as a result of work by committee on steels and numerous subcommittees in meetings held in Philadelphia and Washington. Recently approved was a new specification for stress relief annealed cold drawn carbon steel bars.

Several revisions were made to clarify intent of words such as: Lot, heat numbers, etc., and to state in a clear fashion requirements on number tests in three pipe specifications for service at high temperatures. Major revisions were approved in tentative specifications for alloy castings for high temperature service with five new grades added. These alloys which have come into extensive use include: Molybdenum - vanadium, nickel-chromium-molybdenum, chromium-molybdenum (2 grades) and carbon-molybdenum.

Subcommittee concerned with springs, and spring wire is investigating a twist test which might be desirable in some instances and has a standard test for spring wire ready for submission to main committee. Results of study by forging subcommittee will be a complete overhauling of at least four of the important specifications covering carbon and alloy steel forgings for railroads and industrial uses. A macroetch test for forgings which would be applicable particularly to products covered in specifications A 235 to A 238 has been completed.





Here's Why

Century Motor Insulation Contributes to Long Life

Windings and Insulation Are Built Into a Rigid Mass That Is Highly Resistant to Moisture and Abrasion

One of the important reasons why Century motors stay on the job is that they are so well protected to resist moisture and abrasion — hazards that often cause motor burnouts. The following information on Century motor insulation shows how Century engineers have solved the problem.

No. 1 — The insulation on the wire insulates between turns of the coil.

No. 2 — A combination of heavy fish paper and varnished cloth with high dielectric strength forms the slot insulation. This insulates the coil from the stator iron.

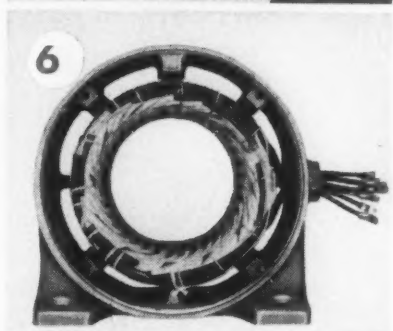
No. 3 — Fish paper formed to the correct contour and size insulates the coils from each other in the slot.

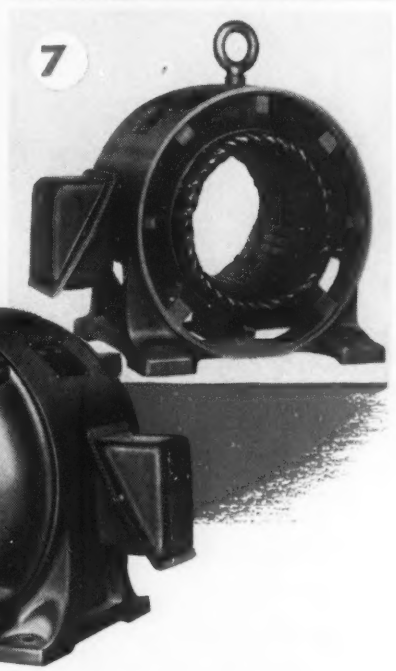
No. 4 — The "U" shaped fiber wedge draws the edges of the slot insulation together, closing the insulation cell, holding the coils in the stator iron — and wedging the coils rigidly in the slot.

No. 5 — Shows how the coils are fitted into each slot together with the three pieces of insulation.

No. 6 — Shows the stator after the winding job has been completed, but before it has been dipped into the insulating compound. Notice the neat compact job of inserting and connecting the coils and lead wires.

The stator is then dehydrated in an oven, and immediately thereafter dipped into Century's special insulating compound and then baked. After each stator is thoroughly baked, repeating this process as necessary, it is given a final coat of heavy air drying varnish for mechanical protection.





No. 7 — The final result is a rigid mass that is thoroughly insulated — highly resistant to moisture and abrasion. The individual wires are held together and sealed to the stator core, eliminating chafing between wires and between coils and stator iron.

Century builds a complete line of electric motors and generators, fractional and integral horsepower, in the popular sizes to meet the requirements of industrial production, commercial uses and appliance applications.

Specify Century for all your electric power requirements.

Century C MOTORS

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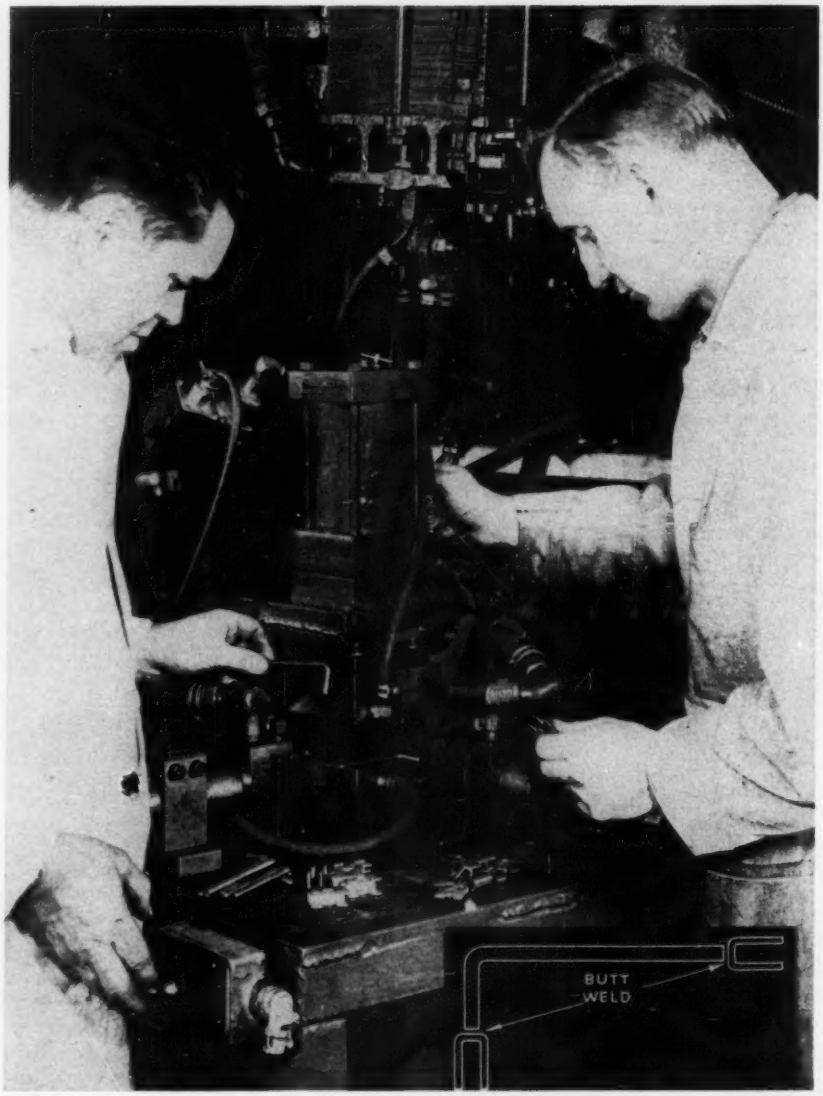
Offices and Stock Points in Principal Cities

Conversion from

Spot to Butt Joining

Steps Up Wrench Production



CONVERSION of standard portable spot welding gun equipment to a stationary butt welding "machine" by use of an air clamping stationary fixture has made possible assembly of automotive radiator petcock wrenches at the rate of 150 double end units per hour. The machine, devised by Progressive Welder Co., Detroit, applies clamping pressure by means of a standard air cylinder, controlled by an air valve mounted on the cylinder support, convenient to the operator.

Projection welder type air clamping dies hold the shank of the wrench, made of a bent steel rod to which two U-shaped mild steel stampings of different sizes are welded. The two jaws are dropped over specially formed electrodes of two standard hydraulic push guns mounted in place. The guns move the petcock wrench jaws up to the shank under welding pressure to form the series butt weld.

Welding Cycle Controlled

Balance of the equipment consists of standard 50 kilovolt-ampere portable gun welding transformer, an air-hydraulic booster to apply welding pressure and a weld timer, mounted on a nearby wall to control the welding cycle. Electrodes, dies, cables and transformers are all water-cooled.

Machine is operated by two individuals, one in front of each of its two guns. They may either stand or sit, operation is said to be just as easy in either position. Operator at right loads the wrench shank and one jaw and operates the air clamp control as well. Operator at left loads the other wrench jaw and initiates welding cycle by pressing the palm switch, shown at left below, and unloads the completed wrench.

University Offers Management Course

Comprehensive training in production planning, job evaluation, motion and time study, wage incentives, plant layout and related subjects will be given by University of Iowa, Iowa City, from June 7 to 19, 1948. Practical applications will be combined with fundamental training for the benefit of industrial personnel enrolled, and attention will also be given to conducting factory training programs.

Because of the diverse interests of those attending the course, sixteen different options in various phases of management activities will be offered during afternoon sessions. Teaching staff, lecturers and forum leaders for the course are members of university departments of industrial engineering and also representatives of industrial concerns.

Screw Thread Holds Liquid Under Pressure

Originally designed for studs, the principle of thread design called a Lok-Thred by National Screw & Mfg. Co., Cleveland, is now being used for screws and bolts. Its positive sealing action eliminates bosses and blind tapping in many cases.

In a recent test a 7/16-inch stud was driven into a cast iron liquid test block with kerosene used as test medium. There was no leakage although pressure was increased in increments up to 3000 pounds per square inch. In a similar test using an aluminum test block, pressure was applied up to 1500 pounds per square inch without leakage.

—o—

Efforts made to prolong life of automotive and aviation engine pistons by coating tops with pure beryllium are described in a report available from Office of Technical Services, Department of Commerce, Washington. Full details on manufacture of beryllium and its alloys by German and Italian firms are contained in report. Also included are translations of documents on subjects such as extraction processes, statistics of production and analytical procedure.

Minimizing Oil Fire Damage In Quenching Areas

Fig. 1—Typical oil storage room

Steel plant area 150 x 600 feet, with oil cooling towers, transformer banks, oil storage, pump rooms, furnace basements and quench tanks made less hazardous by single fire extinguishing system

By FELIX C. RODGERS
General Manager
Cardox Corp.
Chicago

MODERN manufacturing plants must operate without interruption to show a profit. This fact is understood especially by managers of plants engaged in the manufacture or fabrication of steel and steel products. All delays are costly. Some are unavoidable. But delays due to fires which seem to be inherent in many steel plant operations can be minimized.

To explain in more detail just what type of a fire-protection system might be found in a large steel plant, a typical installation in one of the nation's largest mills is described here. Circular quench tanks, 13 feet in diameter, filled with highly volatile quenching oil, into which are plunged large forgings at high temperature, present fire hazards even more pronounced than those found in conventional quenching operations.

This operation is one of a number of hazards protected by a single fire extinguishing system with its centrally located source of extinguishing medium-low pressure carbon dioxide. The arrangement provides both manual and automatic control and extinguishment by both direct application and total flooding. Fixed nozzle protection with both linear and projection type nozzles is augmented by flexible hose reel protection.

The particular portion of this huge plant containing the system and hazards under consideration in this article is approximately 600 feet long and 150 feet wide. Within this area are oil cooling towers, transformer banks, oil storage, oil pump rooms, furnace basements, and circular and rectangular shaped oil quenches. This group of truly representative hazards, embodying a variation in method of application and control, is protected with a fire extinguishing system engineered and manufactured by Cardox Corp., Chicago.

Fire extinguishing medium used in this system is low-temperature, low-pressure liquid carbon dioxide, stored in a single storage unit having a capacity of 10 tons. In the insulated, refrigerated pressure vessel of the unit, the liquid carbon dioxide is maintained at a constantly controlled temperature and corresponding pressure (0° F temperature and 300 pounds per square inch gage pressure). The unit provides double-shot protection for the largest single hazard and multiple-shot protection for other hazards

Uniform Fire Extinguishing Properties — At the temperature and pressure conditions mentioned above, carbon dioxide has uniform, enhanced fire extinguishing properties. The

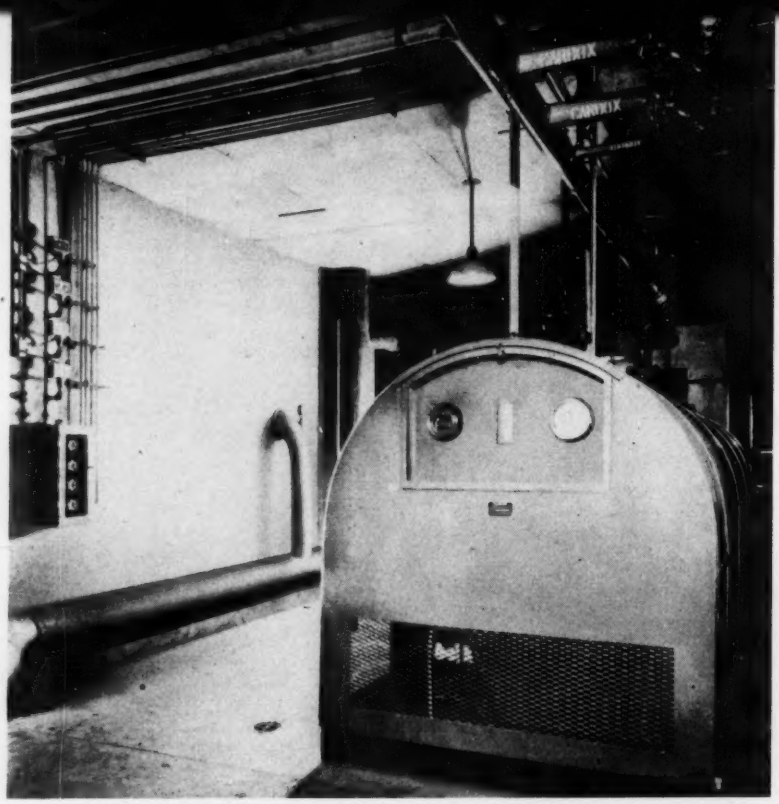


Fig. 2 (above)—Ten-ton Cardox storage unit in which carbon dioxide is kept at 0° F and 300 pounds per square inch. Electrically operated master control valves may be seen above storage unit at right. Manual pilot control cabinet on wall to the left provides stand-by operation in event of any interruption of power from normal electrical control

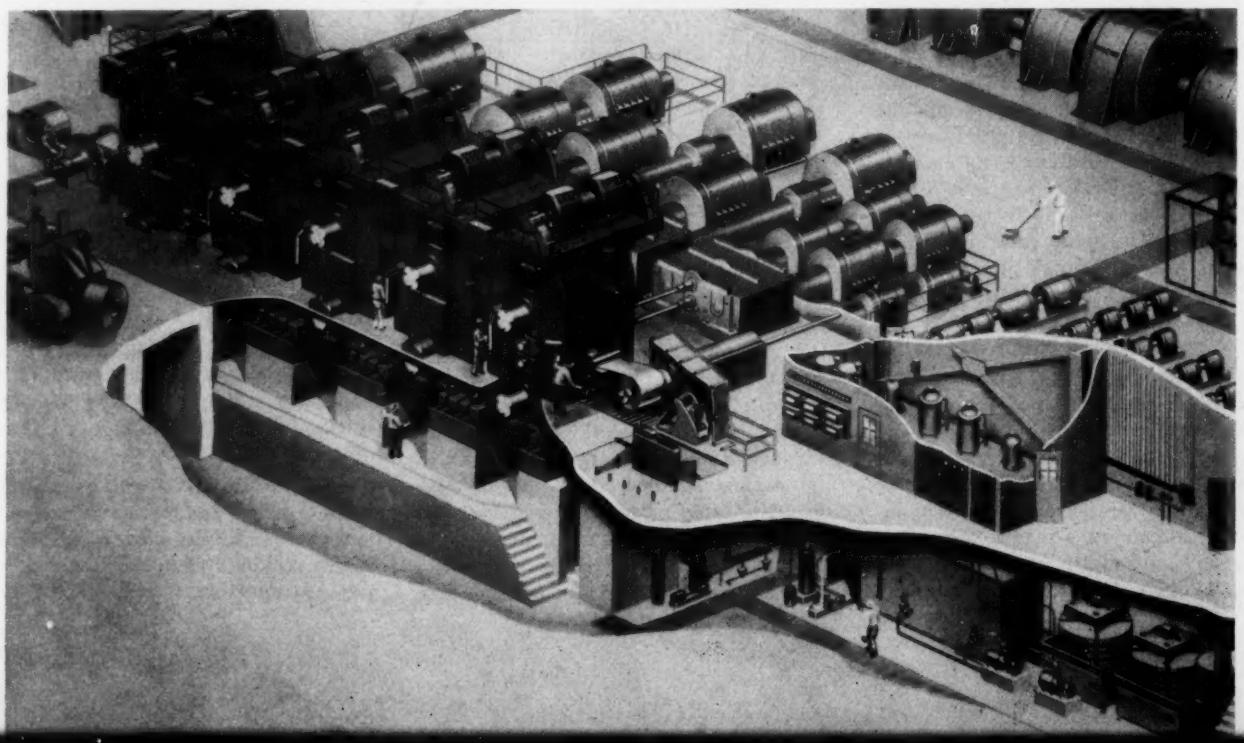
Fig. 3 (below)—Example of a Cardox-protected oil cellar is seen in this drawing of Jones & Laughlin Steel Corp.'s new five-stand tandem mill. If a fire of any magnitude gets started in the basement, the steel supports for the mill, with their heavy load, would soon sag and throw the mill out of line

amount and duration of discharge into a hazard can be accurately determined, independent of atmospheric temperature. Increased cooling effect is achieved as a result of the high yield of "snow" or finely divided particles of solid carbon dioxide or "dry ice." This snow accounts for 47 per cent of the total amount of discharge and, having a temperature of minus 110° F, produces a powerful cooling effect which enables cooling below the ignition temperature of the combustibles, thus preventing any possible "flash-back" or rekindling of the combustibles after initial fire has already been extinguished.

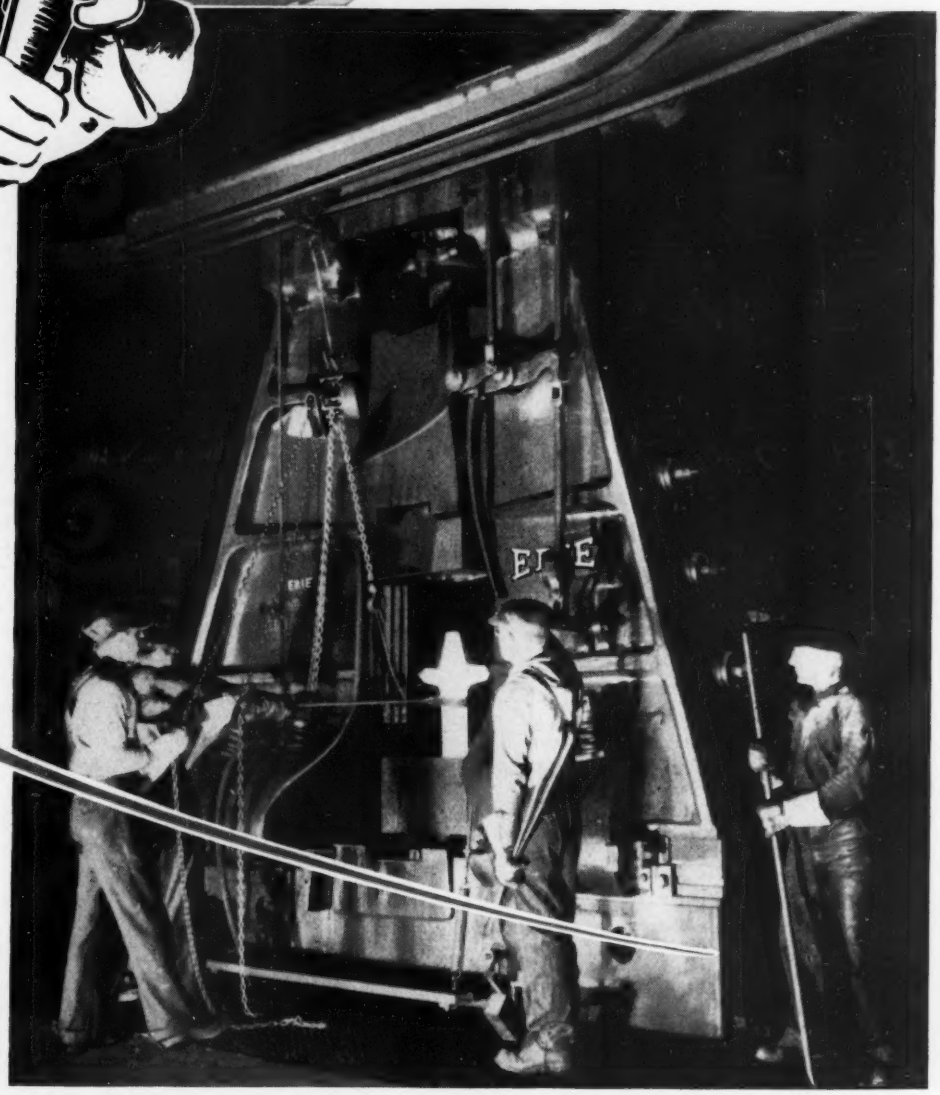
Low-pressure carbon dioxide therefore provides, in addition to the characteristic smothering of the fire, a cooling effect necessary for complete and final extinguishment. The high snow yield also permits more effective projection, an important consideration with hose reels and outdoor applications where wind currents, strong up-drafts and cross air currents must be combatted. High snow yield means a relatively great density which allows this more effective projection; to illustrate this point try to throw a handful of feathers (low density) and then repeat with a handful of stones (high density).

In addition to a good fire extinguishing medium and a suitable method of storing and applying it, a complete system must include a satisfactory distribution system of piping with discharge valves under proper control. In this particular piping system, a 6-inch header at the storage unit or tank serves six branches as follows: 4-inch branch to transformer bank with 3-inch sub-branch to oil cooling tower; 1-1/2-inch branch to two quench tanks with 1-1/2-inch sub-branch to oil storage room and 1-inch sub-branch to oil pump room across railroad tracks; 1-1/2-inch branch to three quench tanks and four hose reels; 3-inch branch to west basement furnace room; 3-inch branch to east basement furnace room; 1-1/2-inch branch to six quench tanks along south wall.

Electrically - operated solenoid valves installed in these various mains permit discharge into the proper hazard in response to control either manually, as for example the quench tanks, or automatically by actuation of a thermostat. Control of the discharge into the various hazards is



"... A Peculiar Sort of Joe... He Always Makes Them Better Than the Other Guy"



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The competitive spirit in craftsmanship is strong. Hammergangs know their hammer like sailors know their ship. Most Hammermen brag about how much better they forge parts "than the other guy" . . . thus paying a high compliment to their hammers. Erie Steam Hammers, Board Drop Hammers, Single and Double Frame Forging Hammers, and Pneumatic Hammers long ago won top place in the hearts of the Hammergangs operating them. *They're Engineered and built to stand the gaff . . . frames, anvils, and all stressed parts in Erie Hammers are all steel.*

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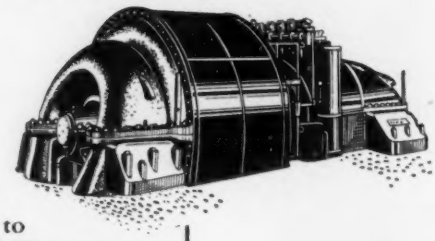
Filtered Air solves blade erosion problem on Turbo-Blowers



WHY should the life expectancy of impellers in turbo-blowers be limited to six, nine or eighteen months? The reason —when quantities of abrasive dust and dirt, such as found in unfiltered air, are permitted to enter a high speed, rotary blower, rapid wear and erosion of the impeller is certain to result.

Installation of AAF Multi-Duty Air Filters at the blower intake has proven a practical solution to this problem. In one mill, where unfiltered air had completely ruined the impeller after 17,000 hours' operation, the replacement unit checked after 12,000 hours with Multi-Duty filtered air showed no trace of erosion.

The AAF Multi-Duty is an automatic self-cleaning air filter. Overlapping panel construction of the filter curtain combines positive self-cleaning and high efficiency air cleaning as integral functions of the operating cycle. Uniformly constant air supply is assured as operating resistance remains fixed when once established for a given dust concentration.

The Multi-Duty's record of prolonging impeller life, eliminating costly repairs and untimely shutdowns warrants your immediate investigation. For complete information contact your local AAF representative or write direct to:

AMERICAN AIR FILTER COMPANY, INC.
443 Central Avenue, Louisville 8, Ky.
In Canada: Darling Bros., Ltd., Montreal, P. Q.

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AIR FILTERS
AND DUST CONTROL EQUIPMENT

either manual-electric, as in the case of the quench tanks, or automatic electric for all other hazards.

Quench Tank Protection — Let us first consider the quench tank protection. At a safe distance from each quench tank, attached either to an adjoining column or wall, is a lever-operated, quick-acting gate valve, equipped with a limit switch having electrical connection to a master solenoid valve at the tank header, permitting opening and closing of the master valve simultaneously with the selector gate valve adjacent to the quench tank. The master valve is provided with a normally-closed pilot valve which, in the event of power outage, opens and allows carbon dioxide pressure to operate the master valve, opening it and keeping it open so as to fill the entire main, with carbon dioxide becoming available at each manually - operated selector valve. Either with or without electric current, duration of the discharge is controlled by the operator's opening and closing of the selector valve.

Supplementary manual operation of the master solenoid valves by means of carbon dioxide pressure through a pilot control valve installed in break-glass cabinet, can also be accomplished. The foregoing example embodies purely manual operation. Automatic operation affords continuous, uninterrupted protection through the use of heat actuated devices. A typical example of automatic operation is found in the oil pump room. Heat actuated devices (in this case electrical thermostats) are strategically located on the ceiling and set to actuate at a predetermined temperature, placing the system in operation through connection with the control panel.

First, an alarm circuit, through its relay, sounds a predischarge alarm in the hazard, warning the personnel to vacate the premises. Another circuit, through its relay, actuates the solenoid valves (master and solenoid), thus releasing sufficient carbon dioxide for the desired room concentration to accomplish extinguishment. A motor-operated timer, located on the control panel, is set to determine the alarm period and the duration of discharge. Complete cycle is purely automatic. Automatic control as above described is also augmented by manual-electric pushbutton stations, to place the system in operation when a fire is detected by the personnel before the thermostats have had a chance to function. Pushbutton stations have domes with lights to assure easy spotting and also to indicate that electric power is on. The pushbutton is in a break-glass enclosure.

Adequate Quantity of CO_2 — Ex-

tinguishment of a fire with carbon dioxide requires an adequate quantity of carbon dioxide, piping designed to distribute the fire-extinguishing medium, control of the discharge of this medium and proper placing of nozzles which are designed to make good use of the properties of low-pressure carbon dioxide. Cast nozzles, attached to the piping system at or near the ceilings of the two basement furnace rooms, oil cooling tower, oil storage room and oil pump room permit a discharge into the respective hazards to accomplish "total flooding" or a sufficient concentration of carbon dioxide to prevent combustion and achieve extinguishment anywhere in that particular hazard.

Other cast nozzles arranged to discharge against all outside surfaces of the transformers afford fire extinguishment by "direct application" which creates a temporary area flooding effect wherein the fire is actually smothered and cooled out. Linear nozzles attached to the side or circumference of each quench tank also accomplish extinguishment by "direct application" with a sheet of carbon dioxide discharged over the surface of the oil. All types of nozzles are designed to secure an effective projection of the high percentage of "snow" characteristic of low pressure carbon dioxide installations.

In addition to a "fixed piping" system for the protection of the principal hazards, there are four hose reels strategically located to afford flexible protection to a number of hazards. Each reel contains 100 feet of hose, discharge being controlled from a manual valve on the playpipe in the hands of the operator and being placed in operation electrically by the pressing of the "on-off" pushbutton in adjacent pushbutton station. This pushbutton actuates the master solenoid valve at the tank header which permits discharge into the line supplying the four hose reels. A normally closed pilot valve, previously described, opens the solenoid valve in the event of a power outage, thus making carbon dioxide available at all hose reels for immediate use. The high "snow" feature of low pressure carbon dioxide installations is even more important in the efficiency of hose reels as the ability to project this snow long distances makes the hose reel a potent fire fighting implement.

System in Operation — While fires are not commonplace or every-day occurences, they do break out occasionally in spite of all precautions. Let us consider a typical fire, commonly thought to be inherent in steel plants. Assume that a fire has oc-

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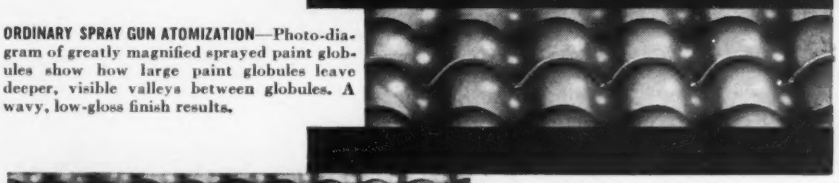
ORDINARY SPRAY GUN ATOMIZATION—Photo-diagram of greatly magnified sprayed paint globules show how large paint globules leave deeper, visible valleys between globules. A wavy, low-gloss finish results.



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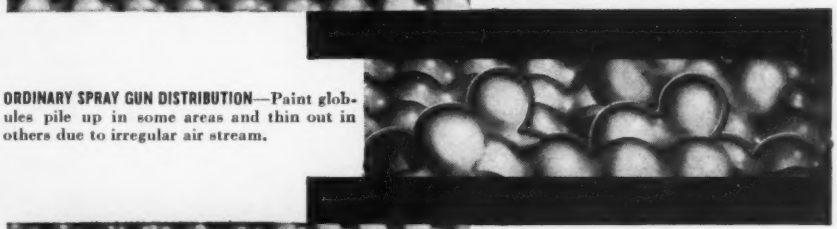
ORDINARY SPRAY GUN DISTRIBUTION—Paint globules pile up in some areas and thin out in others due to irregular air stream.



Brake Shoe MICRO-SPRAY DISTRIBUTION—Uniform flow of paint globules to the surface provided by uniform precision and streamline design of air passages, which prevent eddy currents.

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curred at one of the quench tanks, some of the burning oil spilling out over the floor. The operator dashes over to the control valve located at a safe distance from the quench tank and easily operated. This is the lever-handle valve which has been previously described; it is equipped with limit switch connected to the solenoid valve at the tank header to assure simultaneous opening of both valves when the lever is thrown.

Operator keeps the valve open until enough carbon dioxide has been released through the linear nozzle to extinguish the fire. The carbon dioxide will sweep across the surface of oil in the quench tank, spill over the sides and roll along the floor—all in a matter of seconds—to thoroughly mop up any remaining vestige of fire. Upon complete entinguishment, the operator closes the valve, which in turn (by virtue of electrical connection through the limit switch) closes the solenoid valve at the tank header. The time and corresponding quantity of discharge is determined by the judgment of the operator in this case, although fully automatic protection is frequently provided for quench tanks. The quench tank is immediately available for resumed operations with a minimum loss of time and no damage to the oil, materials or equipment.

In the case of the hazards in the plant protected by automatic application a similar sequence of operation takes place, except that the carbon dioxide is released in a timed discharge in which a sufficient quantity is applied to assure a concentration that will achieve positive extinguishment. This same timed cycle, including all automatic functions, results from operation of the pushbutton station.

Following extinguishment it is only necessary to allow ventilation of the premises, if the fire itself has not caused damage of a nature to stop operations in the hazard affected. There is no damage by the extinguishing medium and no residue to be cleaned up. The system should be inspected to determine whether heat from the fire has harmed thermostats or wiring. If no such damage is discovered, the system is then reset and is ready for new emergencies.

Reserve supply of liquid carbon dioxide in the storage unit enables continuous protection until the specially designed truck used to transport low pressure liquid carbon dioxide arrives to replenish this reserve. Even during refilling there is no interference with protection, since the liquid carbon dioxide is pumped at a rate of several tons an hour from the truck into the storage unit.

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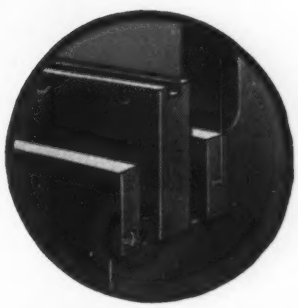
Capacities ranging from 4 ft. of 12 gauge to 16 feet of 3/8 inch Steel Plate



The heavy steel plate construction of Dual Press Brakes enables you to operate them continually at their rated capacities without undue stress or deflection in the various parts.

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The Dual 2-way Bolster adapts machine to many uses *instantly*. In vertical position it receives standard dies for bending and brake work. In horizontal position is used for forming, notching, blanking, and multiple punching.

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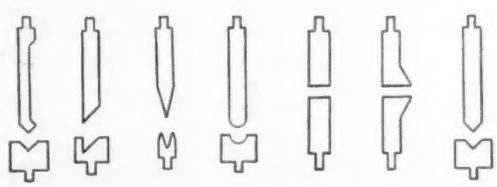

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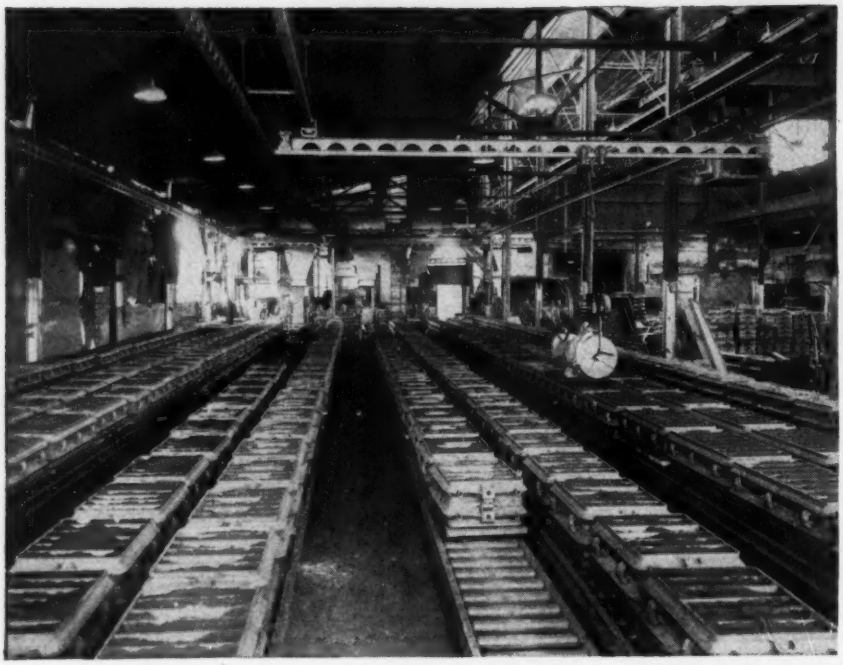

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that means economy

There is one thing that can always be said about conveying equipment that goes into heavy industry — it gets an awful beating. And, it's got to be tough to stay on the job. Plant operating men, responsible for keeping costs down, know that very well — and so do conveyer people who have had years of experience in designing conveying equipment that will work under severe service.

Mathews Engineers like heavy jobs, probably because they've handled so many of them. They've put gravity and power conveyers and special conveying machinery in just about every place it can be used to advantage in foundries, steel plants and brass mills.

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Uniform Tank Coatings

(*Continued from Page* 80)

Original layer of galvanized zinc appears to be intact along the inner surface of both steel sheets shown in the right hand photograph where the bottom curves away from the outer shell. A small portion of the galvanized layer shows clearly at point J. Grainy material in the space between the steel sheets in this portion of the specimen is zinc which was melted by the welding heat and forced out of the weld. This excess zinc appears rough and uneven to the naked eye, but all cross sections examined under the microscope indicated that a continuous seal existed entirely around the heater shell between the inner and outer steel sheets such that no steel can be exposed directly to water.

Fig. 11 is an enlargement of area G, Fig. 9. This is a photomicrograph at magnification 1000 and shows a cross section perpendicular to the plane of the weld fusion joint near point G. At this point near the top of the weld proper, the original galvanized layers have disappeared entirely and a sound joint appears to exist between the two steel surfaces, except that a layer of material believed to be zinc-iron alloy has been trapped between the steel sheets. The zinc-iron alloy constituent runs across the center of the picture from right to left in the same orientation as in the original low magnification micrograph in Fig. 9.

Fig. 12 is an enlargement of the area at the left of point G, Fig. 9, at magnification 1000, and is in the original weld immediately below point G. At the midpoint of the right edge of this picture, a vestige of the zinc-iron alloy constituent remains. This shows up as a rectangular grain about ¼-inch in diameter with a black spot in its center.

Following across the midpoint of the picture toward the left, complete fusion of the two steel sheets has occurred with no evidence of zinc or zinc-iron alloy remaining. The general structure seen in this photomicrograph consists of large grains of ferrite with minute areas of pearlite and large rounded black spots representing inclusions in the steel. Some polishing scratches running from left to right, tilted upward toward the left, and two scratches perpendicular to the others, may be seen in the center portion. This area of complete fusion is not within the "sunburst" area shown in Figs. 7 and 8.

In general, at the top of the weld where the bottom curves away from the shell, it appears that molten zinc

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Maybe your founder said "Stick to iron, boys"—but he never dreamed of a day when you'd be able to compare the price tags of American Magnesium Castings with gray iron!

Of course, Grandpappy never had a chance to count the savings of castings as *smooth* as American Magnesium Castings' as-cast surface. The savings of superlative *machinability*—with the first cut often the finish cut. Or the savings of *lightweight* castings—75% lighter than iron—35% lighter than aluminum! They can be *handled* through production, rather than *trucked* or *hoisted.*

Nor did Grandpappy face conditions where he had to cut production schedules because of casting shortages. Had he known all these things—and had a chance to outsmart competition to boot, with a modern, lightweight product in plentiful supply, he'd have been the first to call the nearest Alcoa Sales Office, or write ALUMINUM COMPANY OF AMERICA, sales agent for American Magnesium products, 1721 Gulf Bldg., Pittsburgh 19, Pennsylvania.

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from the heated weld zone has been squeezed out into the open space above and has solidified in droplets which have become solidly fused to the surface of the original zinc galvanizing. The combination of original galvanized zinc and flowed excess zinc squeezed upward from the weld zone appears to have formed a continuous protective layer over the steel surface which protects the entire upper portion of the weld inside the tank from contact with water. Quality of the resultant product has been further proved and the above statements verified in accelerated salt spray corrosion tests and accelerated service tests, which have produced failures at points other than the junction of bottom and shell in all cases.

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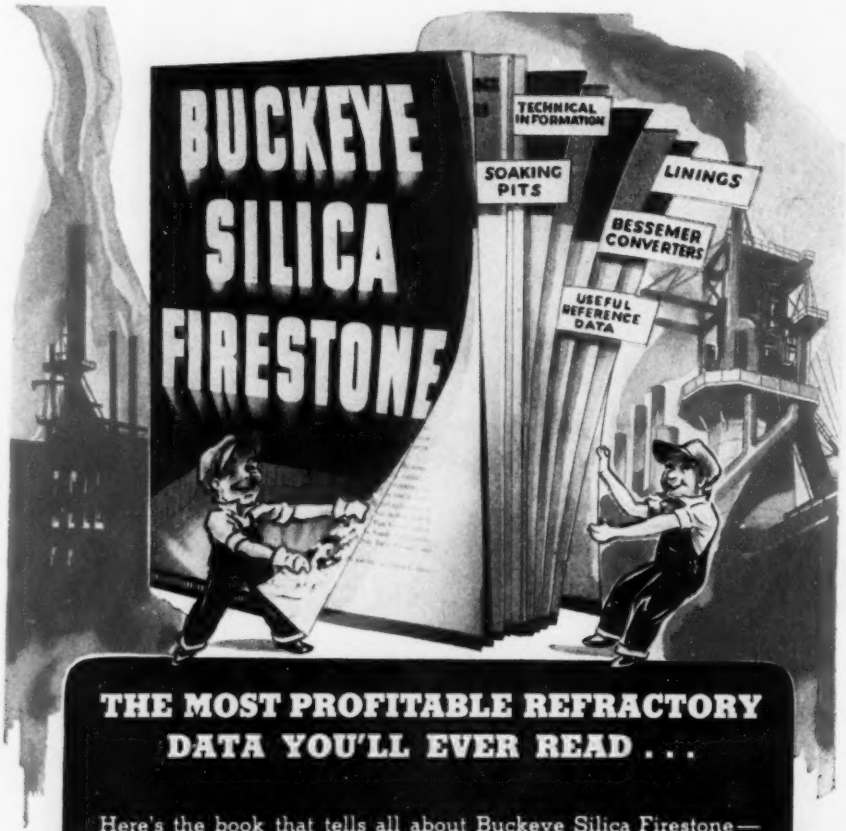

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Industrial Packaging Trends Will Be Exhibited

First showing of new trends in the methods, materials, design and use of packing, packaging and shipping machinery will be given to industry at the American Management Association's Packaging Exposition and Conference from April 26 to 30, 1948 in Cleveland. An association survey found that many manufacturers are completely redesigning and restyling their packages to meet new consumer demands and to ease physical handling of products in the channels of distribution.

Several large concerns report that the determination of why a package attracts consumers is being taken out of the realm of opinion and made the subject of exhaustive scientific study. In many cases psychological and physical tests are made of such factors as shape, color and materials. Trend of machine design in the packaging processes is toward integrated units which will label, fill, fold, print and perform other necessary steps in one unit.

Another important factor in packaging is the reduction of damage of packages in shipment. Many companies realize that they lose a great deal more than they can make up in damage claims due to delay to the customer and loss to the dealer while the shipment is being replaced. Packaging means that will reduce losses in shipment are, therefore, a major consideration.

Zinc Coating Thickness Test Is Being Studied

Method which will permit rapid shop checks on thickness of zinc coating is being considered by the committee on corrosion of iron and steel of American Society for Testing Metals, Philadelphia. It consists of an additional stripping method in which hydrochloric acid is diluted with an equal amount of water. Determination of uniformity of coating by Preece test is also under study currently to clarify definition of the end point.

In spite of its somewhat limited accuracy and its inapplicability to some types of coating, the Hull-Strausser method for determining thickness of coating is incorporated into many specifications. This fact

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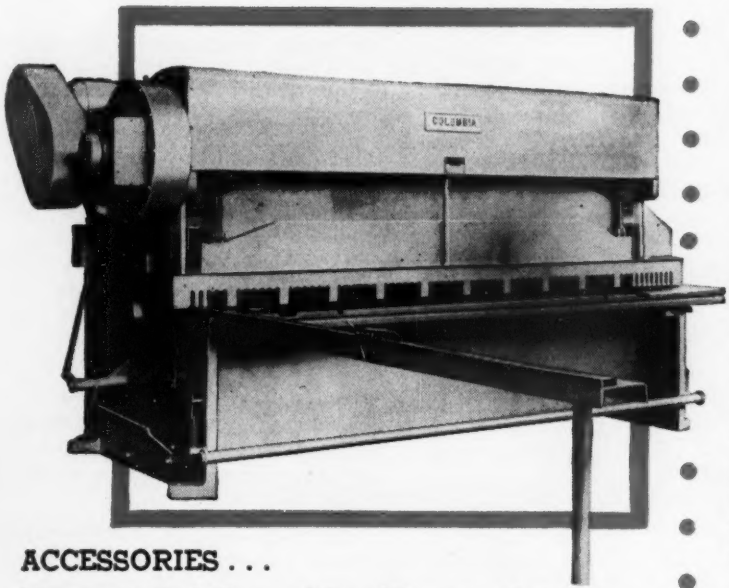
Columbia STEEL SQUARING SHEARS



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Micrometer Back Gauge, 24" or 36" range, adjustable in sixty-fourth inches. Provision for taper shearing. Front or back operation.

Squaring Arm of ten-foot-range, with steel scale and adjustable folding gauge finger, for use on either end of the shear.

Front Gauge with 50" range.

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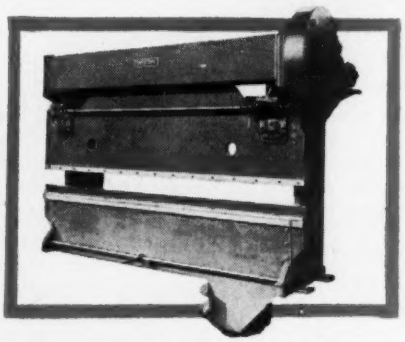

Columbia Power Press Brakes, for forming mild steel, 4 to 10 feet, in 3/16" to 7/16" gauges, offer many cost-cutting advantages.

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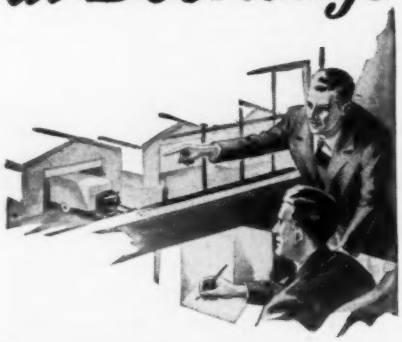
Greatly increased production which makes Columbia one of the nation's largest shear manufacturers makes possible IMMEDIATE DELIVERY of new post-war Columbia Steel Squaring Shears with all important design improvements you need for greatest shearing speed, accuracy and economy. It will pay you to investigate the experience of hundreds of Columbia users before buying. Note these Columbia features:

- **LONGER SHEAR BLADES** than are normally required for cutting full width of material eliminate tearing or nicking when notching or trimming sheets longer than blades.
- **ADJUSTABLE UPPER BLADE HOLDER** has a heavy brace with provision for readily adjusting horizontal alignment of blade.
- **RIGID STEEL CONSTRUCTION** of the base, housing, table, slide, top cross tie, etc., for maximum strength, durability and precision.
- **GEARS OPERATE IN OIL.** Steel gears, precision machine cut, operate in an oil-tight case.
- **SOLID, POSITIVE CLUTCH** has six alloy-steel jaws with hardened faces. Automatic stop cam.
- **HEAT-TREATED, FORGED ECCENTRIC SHAFT** — eccentrics forged integral with shaft.
- **MECHANICALLY-OPERATED AUTOMATIC HOLD-DOWN** has individual high-compression spring compensating fingers, insuring unfailing operation.
- **STAINLESS STEEL SCALES.** Non-rusting, easily-read.
- **CENTRALIZED LUBRICATION** for adequate, dependable lubrication to main bearings.
- **FINGER GUARD** in front of the shear blades.
- **CAPACITY.** 10 and 12 foot models will shear 3/16" mild steel at 60 strokes per minute. Six-foot models will shear 1/4" mild steel at same speed. Standard throat depth, 18 inches.

STOP Efficiency Loss at Doorways

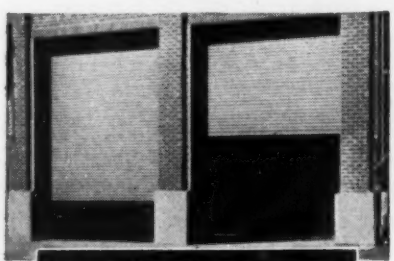


● Plant efficiency often bogs down at doorways without letting you know it. Costs pile up while vehicles wait for doors to be opened. Time and labor is lost when busy employees open or close doors. Heating and air-conditioning costs soar when doors aren't closed promptly.

You can put a quick stop to these profit leaks by installing Kinnear Motor Operated Rolling Doors.* With a touch of a button, you raise or lower these doors at a second's notice—from any number of convenient points. They open straight upward and coil compactly above the lintel; all floor and wall space is *fully usable* at all times. The opened doors stay overhead, safe from damage by wind or vehicles. Their rugged, all-steel construction assures longer wear, lower maintenance, extra protection against fire, theft, and storm damage.

Keep door efficiency in step with the rest of your plant; call your Kinnear representative, or write us today, for full information on Kinnear Rolling Doors.

**Manually operated Kinnear Rolling Doors also available.*



KINNEAR ROLLING DOORS

The KINNEAR MANUFACTURING CO.
1780-1800 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in Principal Cities

has prompted the decision of the committee to confer with the committee on electrodeposited metallic coatings and with the Bureau of Standards to see whether some action is not needed to prevent further misuse of this method.

Rack Used To Handle Green Cores in Quantity

Use of a 6-foot, multishelf, angle iron rack solved the problem of transporting small, odd shaped green cores from the coremaker to the bake ovens at Chemung Foundry Co., Elmira, N. Y. In order to facilitate machining operations before assembling, shelf ledges are made of 2 x 2 inch angles welded flange to flange to form channel like members. Holes are drilled in flange of one angle for bolting to rack frame and notches are cut into the second angle to secure the pipes which make up the shelves.

Pipes rotate slightly when the steel plates holding cores are loaded on or off the rack, but will not rotate during transit due to weight of loaded plates. Various sized cores can be handled by choosing suitable bolt holes in rack frame to give proper shelf height. A special spring frame hand truck made by Yale & Towne Mfg. Co., Philadelphia, is used to transport rack frames.

Extra Sections Vary Steel Conveyor Length

Considerable variety in conveyor length is afforded with addition of either 4 or 5 foot sections to the basic 10 foot length of all steel conveyor currently manufactured by Sermat Conveyor Corp., Chicago. The basic length is composed of a drive section and a takeup section each of which is 5 feet long. Jigs or fixtures can be bolted to heavy gage steel flights which compose the belt for assembly work. Maximum conveyor length possible with extra sections is 175 feet.

Test Developed for Powder Metal Products

Nondestructive testing of porous metal powders, sanitary ware and similar products may be accomplished prior to firing with a method recently developed by Magnaflux Corp., Chicago. Inspection application is expected in powder metallurgy with inspection of compacts before sintering and of finished porous products.

Great reduction of rejected parts after firing has been obtained when the greenware is inspected with the process called Partek. Surface of the body to be inspected is momentarily flushed with a liquid suspension of particles which adhere along cracks. During inspection, cracks are made highly apparent by particle indication which allows quick separation of defective ware from good ware entering kilns. Indications may be either highly colored to contrast with the body or fluorescent for inspection under black light.

Society Conducts Study Of Plating Tests

Method of test for local thickness of electrodeposited coatings is currently being reviewed by committee on electrodeposited coatings of American Society for Testing Metals, Philadelphia, in co-operation with the committee on corrosion of metal and iron. Groups of this committee are also studying existing porosity tests to determine their reproducibility, microhardness and applicability of Jacquet adhesion test, and applicability of various commercially available instruments to measurements of luster.

Subcommittee on electroplating practice has nearly completed a recommended practice for preparation of high carbon steel for plating. It has also organized sections on preparation for plating of zinc-base alloy die castings, copper and copper alloys, stainless steels and aluminum.

Zinc Base Bearings Have Many Industrial Uses

Practical German experience shows that zinc-base bearings are readily used in electric motors, driving rods, coupling rods and axles of narrow gage locomotives, traveling wheels and transmissions for cranes, in crushers and in harvesting machinery according to a report available from Office of Technical Services, Department of Commerce, Washington. In addition, zinc alloys prove excellent as main bearings for machine tools and twist pin bushings in small diesel engines.

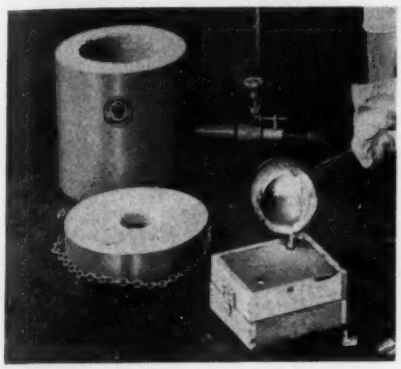
Zinc alloys also can be used as solid bearings due to their high tensile strength at low temperatures. According to the report, centrifugal casting should be used wherever possible since it produces a dense structure. Bearing liner thickness in compound bearings should not be less than 1.5 to 3 millimeters after finish machining.

New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 126

1. Small Melting Furnace

All equipment and tools necessary to produce sand and plaster mold nonferrous castings are included with the Foundry Junior small melting furnace, developed by Sawyer Bailey Corp., 785 Hertel Ave., Buffalo 7, N. Y. Furnace, crucibles, tongs, crucible holder, skimming and stirring

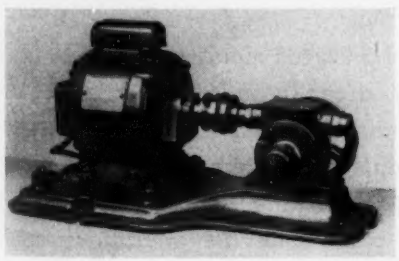


rods, asbestos gloves, goggles, special grade foundry sand, flask, riddle and rammer are included.

Furnace shell is of welded steel construction, is lined with high grade refractory and is capable of operating at 2400°F. Manufactured, natural or bottled gases may be used at normal pressures. Air may be supplied by a motor driven blower, gas-air mixture being controlled by valves. Capacity of furnace crucibles is 10 pounds of aluminum or 34 pounds of brass or bronze.

2. Speed Reducer

Any wood cutting bandsaw using a 1/4 or 1/3 horsepower motor operating at 1800 or less revolutions per minute may be rapidly converted to metal cutting with the Speed Marvel reducer manufactured by Hutchinson

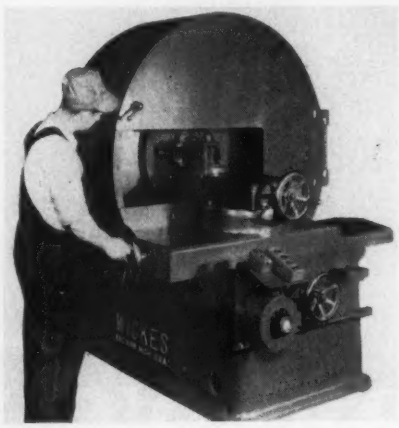


Mfg. Co. Norristown Pa. Adaptable for either horizontal or vertical drive, reducer consists of a casting enclosing a bronze worm gear driven by a hardened steel worm and running in an oil bath. Both shafts run in oilless bearings with the steel shaft having ball thrust bearings on both ends.

Reduction ratio of 30 to 1 gives a speed of 57.5 revolutions per minute with a motor operating at 1725 revolutions per minute. Thus a 12-inch band saw will travel at a speed of 180 feet per minute and with the proper cutting blade will cut soft and low carbon steel, copper, bronze, brass and aluminum.

3. Grinding Wheel Salvager

Grinding wheels up to 42 inches in diameter and 14 inches thick may be handled by the grinding wheel salvaging machine designed by Wicker Brothers, Saginaw, Mich. Wheels



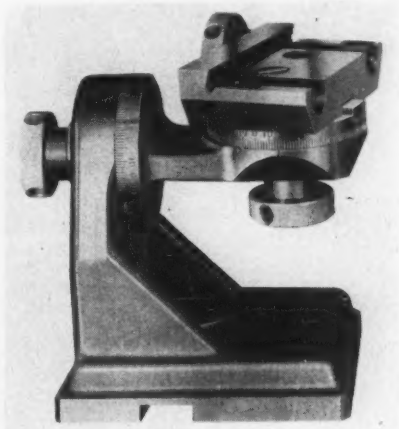
which have served their useful life on one type of grinding machine can be readily reworked for subsequent use on another grinding operation.

Outside diameter or sides can be turned down or the bore enlarged. Angular work can also be performed. Machine is powered by a 5 horsepower direct current main drive motor for operation of main spindle over a wide speed range. Weight including electrical equipment contained on machine is 10,000 pounds.

4. Grinding Attachment

Compound rake and lead angle on the tangential chaser may be ground on the No. 15 chaser grinding fixture, developed by Landis Machine Co., Waynesboro, Pa. Supported by the base casting is a crossarm, arranged so that the chaser platen can be adjusted vertically, this making possible the grinding of any desired rake angle. Platen can be rotated a full 360 degrees, providing an accurate means of producing the desired lead angle.

Knurled knobs, which have pin holes for added leverage, securely hold the



fixture in the position in which it is set. Attachment can be adapted for use on any grinding machine which has a traversing table, regardless of type of grinding wheel used. It may be used on all Landis chasers up to 1-1/4 inches wide.

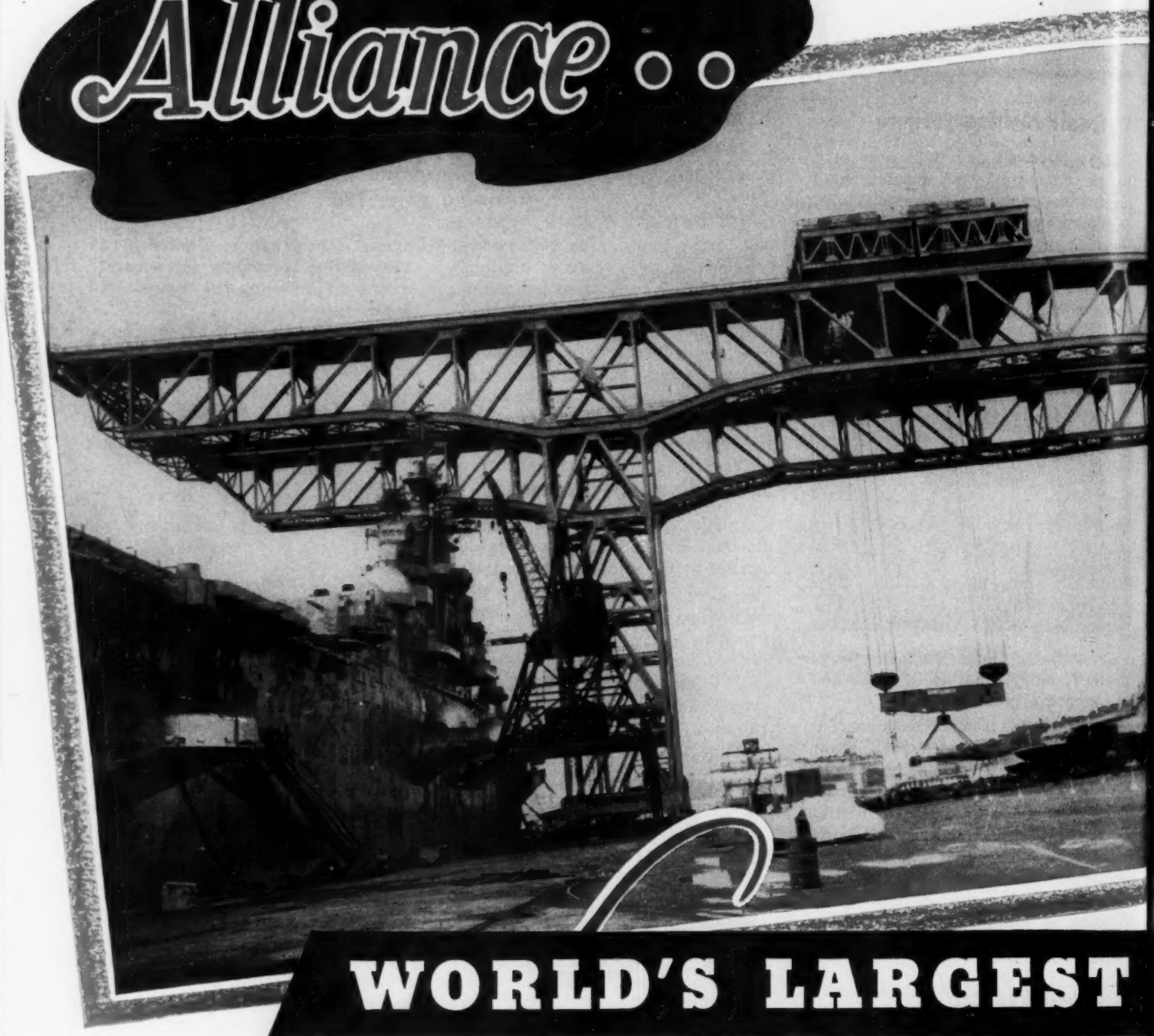
5. Lifting Magnet

Outer ring and top plate are welded together on top of new magnet made by Ohio Electric Mfg. Co., Maurice Ave., Cleveland, O., thereby placing weld in a position where it cannot be

cracked or damaged by frequent blows against outer ring. Three magnet sizes are now in production in diameters of 39, 55 and 65 inches. Each of latter two sizes is available with 6 or 8 coils instead of the standard 4 coils for extra lifting strength.

Chain pins that fit into chain ears with square holes eliminate friction

Alliance . .



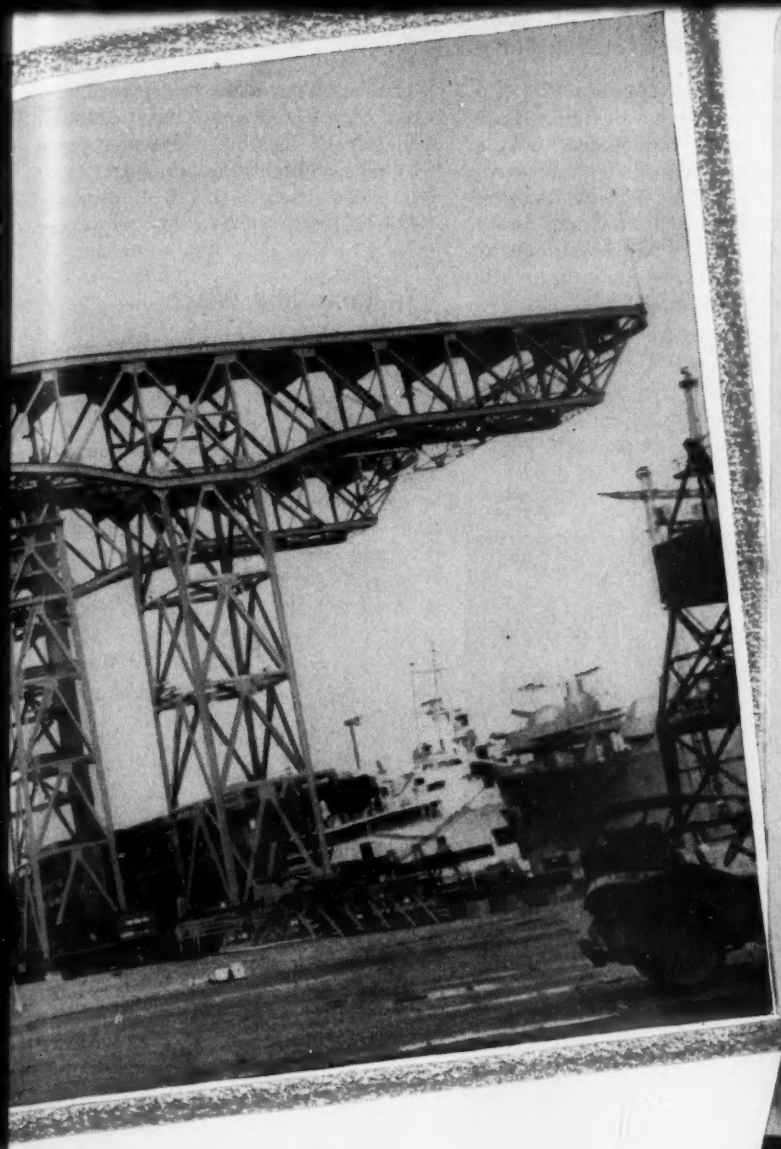
WORLD'S LARGEST Crane

You'll find the world's mightiest crane spanning the Navy's mole at Hunter's Point, California. It's an Alliance, of course, and is so big and powerful that it can easily pick up a 500-ton battleship gun turret. (Formerly, in repairing major ships of the Fleet, it was necessary to dismantle a turret, and hoist one piece ashore at a time—a long, tedious process.) This twin giant crane was recently put to its biggest test when it lifted a 630-ton metal-and-concrete block and set it down so gently on a hen's egg that only the shell was cracked. Then the block was eased downward again, just enough to break the shell without injuring the yolk!

This rugged crane with the amazing precision control is so large that it has its own electric sub-station, aerial beacons to warn aircraft away, and a

THE ALLIANCE M

MAIN OFFICE
ALLIANCE, OHIO



Unusual Features
OF THE WORLD'S LARGEST CRANE:

Lifts up to 630 tons with ease.

Elevation top of trolley is 207 feet above the water.

Overhead traveling cranes are mounted on a runway 730 feet long.

Each crane contains a traveling trolley from which is suspended one main and one auxiliary hook.

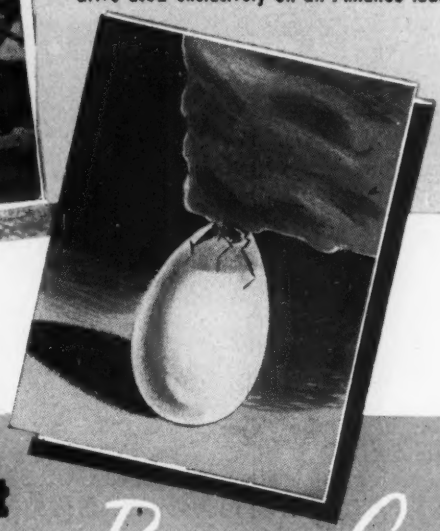
The two cranes can be coupled together electrically and also by means of standard railroad car couplers, so that they can be moved along the runway as one unit by one operator. The main hoist hooks of the two cranes are pin-connected to the ends of a lifting beam, which combines the lifting capacity of both cranes through 500-ton sister hooks trunnioned to the center of the lifting beam.

Direct current motors on the trolleys operate the hoisting drums, obtaining their power from a motor generator set located on the trolley.

Each main hook is supported by 24 parts of 1-3/8" steel rope, and has a rated capacity of 275 tons. More than a mile of hoisting rope is required for the main hoist four part reeving.

The main hoist hooks can reach 25 feet below the water line and lift loads 160 feet into the air. The auxiliary hoist has a lift of 220 feet.

The main hoists are of the synchronized worm drive interlocked drum type, and are driven by two motors. This type of drive was specified by the Navy and was chosen for its greater inherent safety. It is the type of drive used exclusively on all Alliance ladle cranes.



makes the heaviest lift ever known *with Amazing Precision Control*

short-wave radio for communication between the operating crews. Its huge runway is built across a special mole or pier, and its two cantilevers extend 162-1/2 feet out over the water on each side of the mole, towering high above battleships or aircraft carriers berthed below it. The bridge span of the crane is 142 feet center to center of rails and the span of the trolley 20 feet.

Of course, Alliance builds smaller cranes, too . . . all sizes, in fact, to help move heavy loads quickly, safely and easily. Always rely on Alliance to give your plant the economical, **extra** lifting power you need.

LADLE CRANES · GANTRY CRANES · FORGING MANIPULATORS
SOAKING PIT CRANES · STRIPPER CRANES · SLAB AND BILLET
CHARGING MACHINES · OPEN HEARTH CHARGING MACHINES
SPECIAL MILL MACHINERY · STRUCTURAL FABRICATION

HINE COMPANY

PITTSBURGH OFFICE
1522 OLIVER BUILDING, PITTSBURGH, PA.

and prolong life. Cable connections are of a special company design and the weatherproof insulated shell is made of iron. Bayonet joints for hand operation save time in making and breaking connections and shielded contacts provide safety from arc.

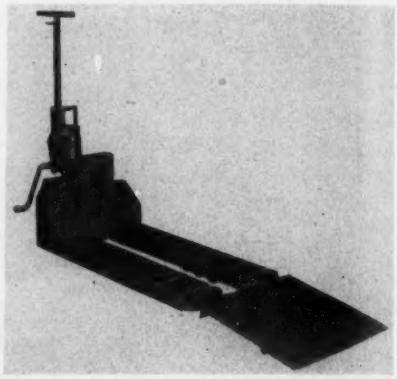
6. Hydraulic Press

Requirements for forming, punching, drawing, broaching, assembling, etc., are met by the two-way gap type hydraulic press of all steel construction, built by Munton Mfg. Co., 9400 Delmont Ave., Franklin Park, Ill. The press ram comes down at high speed under full pressure and returns at a high speed with less pressure. Maximum downstroke is 460 inches per minute and maximum upstroke is 800 inches per minute (figures for 5-ton model).

Stroke is 6 inches on standard model and is adjustable to 1 inch at any position within the stroke. Piston rods are chromium plated for long life and cylinder is steel with welded dome. All parts can be replaced without complete dismantling. Standard equipment includes 6-cylinder pump, by-pass at high pressure, started with overload heater and 5 horsepower, 220-440 volt, 3-phase, 60 cycle motor.

7. Ramp and Winch

Ramp and winch arrangements for handling cases up to 6000 pounds have been adapted for use with their standard pallet type lift truck by Lyon-Raymond Corp., 4747 Madison St., Greene, N. Y. By means of winch and cable a case is drawn up the

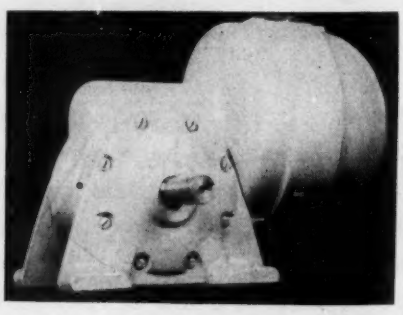


ramp and on truck platform for transportation.

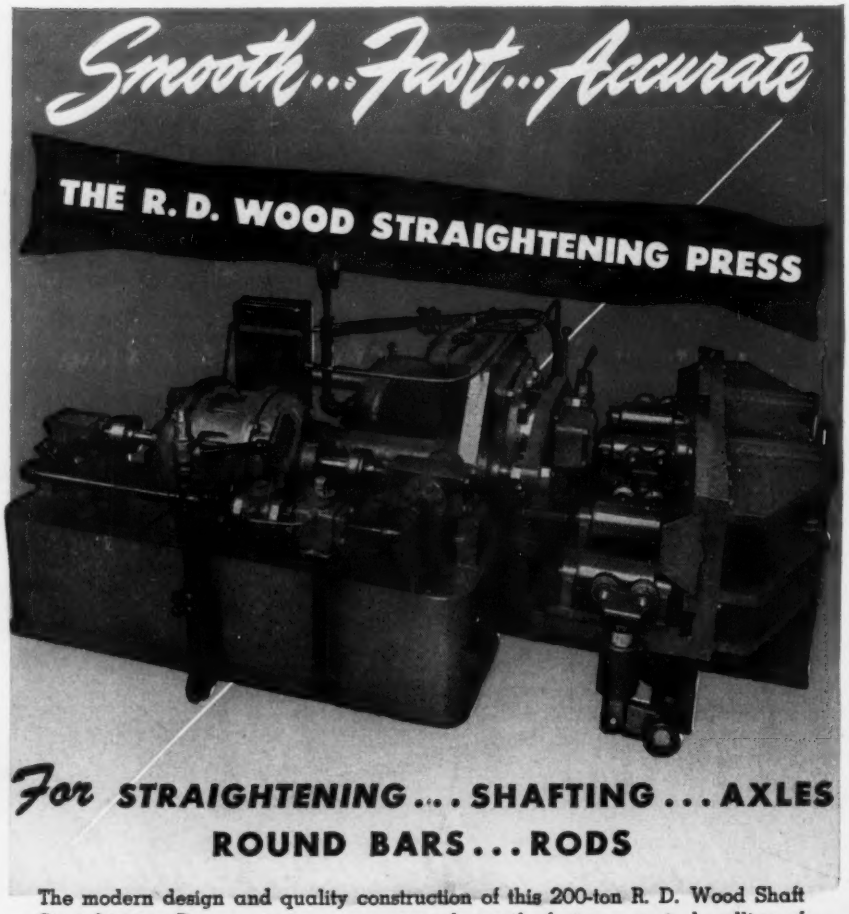
Ramp is hinged and easily removed and winch is furnished with 15 feet of steel cable. In storing a case, load is wheeled into position and truck lift is elevated 4 inches so that blocks can be placed under overhanging sides. Lift is then lowered and removed and case rests on the supports.

8. Motor-Speed Reducer

Right angle single reduction worm-gear type speed reducer, gear housing and motor frame are combined in one unit, the compact, lightweight



Gearmotor, built by Electra Motors Inc., 1110 North Lemon St., Anaheim, Calif. Unit is manufactured in series 400 foot mounted model and series 500 ring mounted model for 3, 2 and single phase alternating current operation, in ¼, ⅓, ½ and ¾ horsepower sizes. All are of general pur-



The modern design and quality construction of this 200-ton R. D. Wood Shaft Straightening Press are your guarantee of smooth, fast, accurate handling of work... *plus* increased production. The press frame is constructed of heavy welded steel and carries individual cast steel main and pull-back cylinders. Press table is 73" long with a gap of 13" between dies. Resistance blocks are movable on the vertical frame face. The table is provided with four heavy stationary rollers for shifting shafts lengthwise, as well as four sets of lifting and turning rollers operated by an air cylinder. An adjustable stop, which will take full press load, is located in the center of the press frame to prevent over-bending. High and low pressure pumps, operated by a 20-hp motor, provide a ram speed of 72" per minute for low pressure closing. High pressure ram speed is 8.5" per minute. Send today for descriptive literature. R. D. Wood Company, Ledger Building, Independence Square, Philadelphia 5, Pa.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ELEVATORS • INTENSIFIERS

R.D. Wood Company

pose, continuous duty type, with ball and tapered roller bearings.

Feature of design is that motor can be assembled in any one of four positions and entire unit can be operated at almost any desired angle. In the ring mounted model, a seal prevents gear oil from leaking into mixing chambers or other equipment. A wide range of speeds is offered.

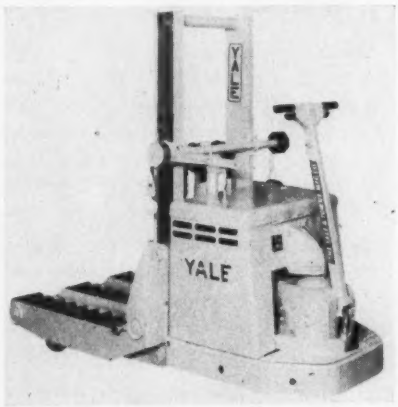
9. Motor Control Center

Control of any number of motors rated up to 200 horsepower at 440 volts from one central location is possible with the motor control center announced by General Electric Co., Schenectady 5, N. Y. Centers are designed so that all connections can be made from the front.

Centers consist of standard starter units which are slid into vertical, cabinet type sections in "building block" style. Sections are 90 inches high, 20 inches wide and 12 inches deep. Starters are furnished in five sizes. Each starter is a complete unit enclosed within the vertical sections. Control interconnections to other motors and controls are made through a special wiring trough which runs length of the section.

10. Die Handling Truck

Heavy dies and molds may be handled by the new 4000 pound capacity Worksaver, built by Yale & Towne Mfg. Co., 4530 Tacony St., Philadelphia 24, Pa., for picking up the dies



or mold at the storage zone, transporting it to the press, lifting it to the press platen level and mechanically loading it into position for use. Truck is operated by one person walking ahead of truck and manipulation of dies is performed by means of the ratchet handle at front of truck.

Roller platform makes it easy to slide dies or molds onto the truck. Platform is in three sections, thus avoiding bending of rollers due to heavy weight. Each of two cables is looped over the correct pulleys and cable hooks are hooded together over front or back of die, depending upon direction load is to be moved. Small truck dimensions make work in congested areas possible.

11. Shape Welding Machine

Welds may be made to any outline by the submerged melt welding process with a new machine manufactured by Linde Air Products Co., 30 East 42nd St., New York 17, N. Y. The WM-6 machine, with a carriage of the type used in shape cutting, carries and guides a Unionmelt welding head. Any desired outline can be followed by use of a strip templet. Unit has a maximum current capacity of 2000 amperes and can weld in a single pass material from 18-gage to 1¼-inch plate.

Machine will operate over a 34 x 80 inch area. Sections can be added to tracing table so that any length can be covered. Welding speed is adjusted by a stepless speed control.

(For more information, use the card following page 126.)

A Complete Warehouse Service for...
SHEETS • PLATES
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TIN PLATE • BARS • SHAPES
WIRE PRODUCTS • ALLOYS
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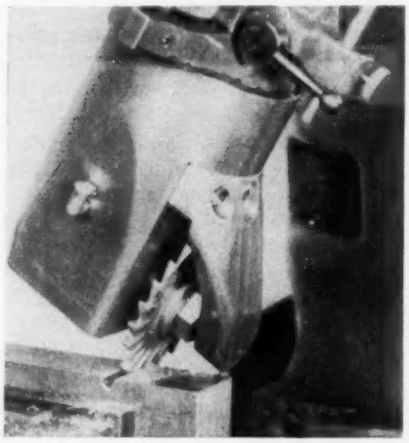
WORLD-WIDE EXPORTERS • NEW YORK • CLEVELAND • SAN FRANCISCO
main office—620 5th AVE., NEW YORK 20
Tri-Boro Steel Supply Co., Inc.

Standard or high speed tracing heads make possible welds at 4 to 40 or 11 to 100 inches per minute.

12. Milling Attachment

Scope of vertical milling machines and other machine tools is increased by the auxiliary horizontal milling attachment, announced by Bemis & Call Co., Springfield, Mass. Adjustable to nearly any position, the head handles precision milling, drilling and

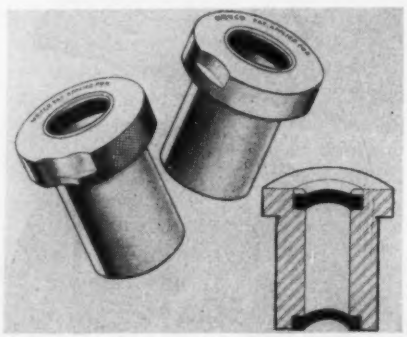


boring at any angle, making it possible to do all the necessary machining with the original setup.

Accommodating one or more cutters up to 4 inches in diameter, it will also take a standard chuck of 1/2-inch capacity for drilling, boring and reaming at a 90 degree angle to the drive shaft. Gear ratio is 1 to 3. Mounting and dismounting is done easily and quickly.

13. Drill Jig Bushings

Carbide inserted drill jig bushings, made by W. F. Meyers Co., Bedford, Ind., have tungsten carbide inserts at the points of wear, thus insuring longer life and greater accuracy for



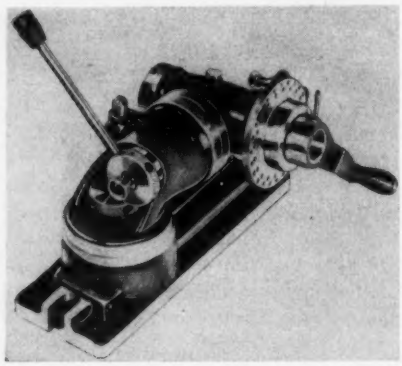
longer periods of time. Part spoilage and inspection time are reduced because of lesser tendency of the bushing to "bell" at the bottom.

A hardened steel ring inserted above the top carbide ring protects both carbide and drill against shock of impact. Bushings are manufactured to dimensional standards of American Standards Association.

14. Grinding Fixture

Recently released by All Tool Co., 110 Long Ave., Hillside, N. J., is an improvement in their grinding and indexing fixture which is designated as model No. 2. Two leveling lugs are added on top of fixture resulting in more accurate positioning.

Spindles take square and hexagonal collets, ⅝-inch maximum size,



and No. 4 spring collet with a maximum diameter of ¾-inch. One draw bar is used with a detachable handle for vertical work.

15. Portable Conveyor

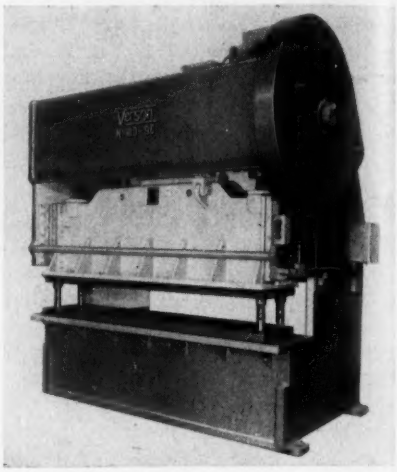
Each end of a portable booster conveyor made by Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y., can be raised or lowered by a positive handwheel. Unit is built with a 24-inch wide, 3 ply solid woven cotton duck belt and has floor locks so that it will not move when placed in position. Belt is reversible and will move material in either direction.

Several of these units can be coupled together for moving parts or packages. In addition to standard models, units are also built to customer's specifications.

16. Gang Press

Line of gang presses developed by Verson Allsteel Press Co., 1355 East 93rd St., Chicago 19, Ill., to bridge the gap between press brakes and large, heavy blanking presses range in capacity from 100 to 350 tons in bed lengths from 72 inches up.

Presses are designed for blanking, forming, punching, shallow drawing and multiple operations whereby a series of operations may be done in one handling, thereby effecting manufacturing economies. Control is by



means of electrical pushbuttons, hand or foot operated, and a selector panel for inching, single stroke or continuous operation.

17. Electronic Micrometer

Hard or soft thin materials of a conducting or nonconducting nature may be measured for thickness by the model K electronic micrometer announced by Carson Micrometer Corp., Little Falls, N. J. Materials as thin as 0.0001-inch may be measured with an accuracy of 20 millionths of an inch with anvil pressures as light as ¼-ounce. Operation

is independent of operator or sense of touch.

Measuring range is ⅛-inch but micrometer head may be raised to accommodate work up to ⅜-inch thick. Hardened steel anvils have flat or spherical surfaces. To operate, lower anvil is retracted by lever at side to insert work. When lower anvil is released, upper anvil is lifted by thickness of work between anvils.

(For more information, use the card following page 126.)

Change to NON-FLUID OIL

From the advent of portable tools, we have made a study of their lubrication—working in cooperation with tool designers and engineers to perfect grades of NON-FLUID OIL that would meet the exacting requirements of different types.

The ability of NON-FLUID OIL to provide dependable, long-lasting lubrication of portable tools is best shown by the fact that NON-FLUID OIL is used for initial loading of tools and is recommended for continued lubrication by practically every leading portable tool manufacturer.

Write for instructive bulletin and free, testing sample of NON-FLUID OIL.

New York & New Jersey Lubricant Co.
292 Madison Avenue **New York 17, N. Y.**

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WAREHOUSES: Charlotte, N. C.—Greenville, S. C.—Atlanta, Ga.
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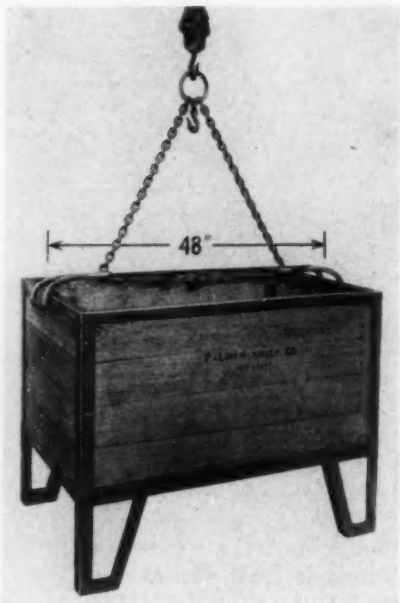
NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

NON-FLUID OIL
TRADE MARK REGISTERED

Exact setting is indicated by light on panel of electronic unit. Micrometer dial shows thickness of material.

18. Universal Grab

Universal grab being manufactured by Palmer-Shile Co., 16025 Fullerton Ave., Detroit 27, Mich., can be used for picking up all types of heavy boxes, crates, bales or other loads where hooks are used. Grip tightens as load increases with the grab which



is available in two sizes with capacities of either 1000 or 2000 pounds.

Heavy forged steel hooks with an adjustable spread provide for easy handling of loads ranging from 16 to 48 inches. Sturdy 3/8-inch BBB chains are used exclusively.

DEVELOPED BY . . .

19. DuBois Co., Cincinnati 3, O., Filmite pigmented paint spray booth masking compound for spray or brush application. Completely water washable, it may be installed near ovens and it will not flake, crumble or dust.

20. Industrial Tools & Products Corp., Rochester 11, N. Y., the Streme-Liner machine for putting down and maintaining industrial traffic lines of various widths. Surface is automatically cleaned before painting.

21. Fischer & Porter Co., Hatboro, Pa., steam jacketed Flowrator instrument designed for materials having high melting points. Instrument totals, records and controls flow rate. Meter indicating extension is furnished with steam heating coils and entire meter body is jacketed for 100 pounds steam gage pressure.

22. Hyprez Division, Engis Equipment Co., Chicago 5, Ill., diamond compounds for rapidly removing scratches, nicks and pits from forging and heading dies. Compound is sealed in dustproof glass cartridges for loading into the applicator gun.

23. United States Rubber Co., Rockefeller Center, New York, N. Y., a nylon-reinforced V-belt capable of withstanding the deteriorating effects of heat and oil. It has high tensile strength and sufficient elasticity to absorb shock.

24. Clipper Diamond Tool Co. Inc., New York 19, N. Y., diamond scriber with diamonds set into a hexagonal aluminum handle 6 inches long. It may be used for marking on any surface, regardless of hardness.

25. A. J. Gerrard & Co., Chicago 1, Ill., strap kit containing complete Steelbinder strapping equipment which may be carried as a small brief case. It contains the strapping tool and cutter and sufficient strapping and seals for several jobs.

26. Kay-Tite Co., West Orange, N. J., Paintmor which, when added to any quantity of paint, doubles the quantity. It also makes it easier to apply, improves its consistency and gives it more elasticity. It will not crack or fade or dry out in standing.

27. Ridge Tool Co., Elyria, O., power drive for operating hand pipe cutters, reamers and threaders. Weighing 100 pounds, the Porta-Power drive has a 3-jaw lathe type scroll chuck in front and a self-centering workholder in rear.

28. Industrial Controller Division of Square D Co., Milwaukee 12, Ill., heavy duty oil-tight foot switch, operable from three directions but protected from falling objects. It has an adjustable stroke and is offered in several contact arrangements.

29. Westinghouse Electric Corp., Pittsburgh 30, Pa., 27 new Flexarc stainless steel electrodes of wide range of types and diameters for all commercial grades of chromium, nickel and straight chromium steel. Titania-lime and straight lime coatings are offered.

30. C. J. Tagliabue Corp., Newark 5, N. J., Tag time-schedule controller which can be synchronized with any system of air operated semiautomatic temperature and pressure control to make process fully automatic.

31. Nutmeg Industries, Bridgeport 7, Conn., an E-Z-Opener for opening of compressed gas cylinders, making possible savings of gas or air as cylinder valve may be closed tighter when not in use. It is a one piece casting, fitted over valve handle and held in place by knurled set screw.

32. Plomb Tool Co., Los Angeles 54, Calif., No. 2135 bending bar with adjustable arms which can be placed in over 100 different positions for bending, straightening, aligning, spreading, etc. Ample leverage is obtained with a 36-inch handle.

33. General Electric Co., Schenectady 5, N. Y., an aluminum enclosed isolated phase bus run for safely interconnecting generators, transformers and switchgear. It is offered for 15 kilovolt applications in ratings of 1200, 2000, 3000, 4000 and 5000 amperes.

34. Smooth-On Mfg. Co., Jersey City 4, N. J., 7B quick floor patch Iron Cement for rapid and economical patching cracks, ruts and shallow holes in concrete floors. Material is dust-free and oilproof and is quick-hardening.

35. Jarett Compressor & Equipment Inc., Newark 4, N. J., Lubri-Filter combination lubricator and filter for compressed air lines. It automatically injects atomized oil into the air line in proper amounts. Oil level can be seen from any angle.

36. P. R. Mallory & Co., Indianapolis 6, Ind., leakproof, ejector type, light duty resistance welding holder arranged so that water circuit forces water against head of electrode tip, regardless of length. Ejector plug simplifies tip removal.

37. Super Tool Co., Detroit 13, Mich., carbide inserts 1½-inches long, offered as standard on their vertical ejector type tools. New length bit offers approximately 12 additional grinds or 48 added cutting faces on square tools. New length is on complete line of standard vertical ejector carbide tool bits.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STRIKE RECOVERY—With coal mining being resumed slowly following termination of the month-long "pension" strike, efforts are being made to restore steelmaking operations to pre-strike levels quickly. However, the best guess is that it will take the mills an average of two to three weeks to get back to normal, the time required varying among the various producers. In general it is thought ingot output will be fully restored by early May provided full resumption of mining is effected this week.

Steel production loss due to the strike up to the end of last week is estimated at close to 1 million tons. However, total strike loss will exceed several hundred thousand tons additional before pre-strike operations are regained since past experience shows the loss during post-strike periods usually equals about 1/3 of the overall strike loss.

INGOT OPERATIONS—Rate of decline in steelmaking operations was checked last week, the estimated national ingot rate falling off only 5 points as compared with 10½ the week preceding. Part of the week's drop was attributable to flood conditions in the Ohio River valley. Prior to the coal strike operations were at 96 per cent of capacity. The national ingot rate last week was estimated at 73 per cent.

STEEL SUPPLY—Effect of the coal strike on finished steel supply remains to be fully determined. There is no question supplies will be tighter. Steel finishing mills are expected to get back to pre-strike operating stride by the end of this month but future losses in production time are likely due to the pinch in semifinished steel which will become increasingly noticeable. Finishing mill operations were held at a high level through most of the coal strike period and this cut heavily into stockpiles.

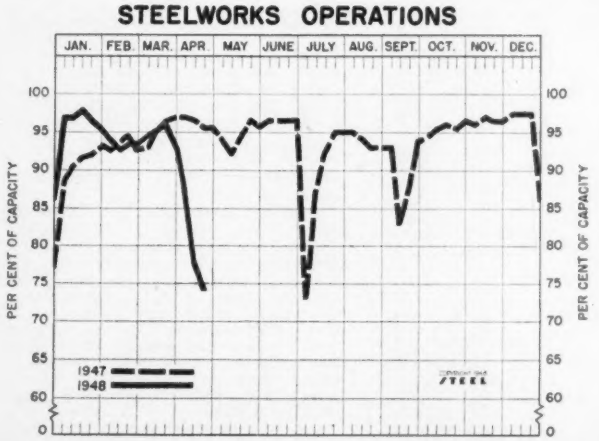
STEEL DEMAND—As a general thing producers had been pointing to May 1 for setting up third quarter quotas. It now appears, however, few mills will be able to hit that mark though some may come fairly close to it, assuming no further production interruptions. For the most part consumers will count themselves lucky if they know where they stand by mid-May. Even after quotas are set up the outlook will remain clouded due to uncertainties for production, such as possible mine labor trouble at the end of June when the miners' contract with the operators expires.

Buyers are becoming reconciled to the possibility of further reduction in their quotas not only because of the amount of back tonnage the mills will have to carry into next quarter, but also because of the probability of tightening supply resulting from increased defense requirements and European aid. Pressure for steel over the remainder of the year promises to continue as severe as at any time in recent months, with prospects dim for attaining supply—demand balance in any of the major products.

PRICES—For the present steel prices, generally speaking, are steady. However, one leading producer last week raised the Detroit and eastern Michigan arbitraries on hot and cold-rolled sheets and strip $1 per ton. Talk is heard in the trade of possible price advances later in the year but none of the steel producers have indicated they are planning such action. Continued rise in costs, of course, will be the determining factor, and in event a wage increase comes out of the current negotiations between the steelmakers and the union, some upward price adjustments would not be surprising.

Composite arithmetical price averages compiled by STEEL held unchanged last week and compared with the like week of 1947 as follows: Finished steel, $81.14 and $69.82; semifinished steel, $68.72 and $52.10; steelmaking pig iron, $39.18 and $32.49; steelmaking scrap, $40.42 and $33.92. STEEL's weighted composite for finished steel is 3.54374c for February compared with 3.49997c for January and the preliminary composite of 3.57435c for March.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Apr. 17	Change	Same Week 1947	Same Week 1946
Pittsburgh	73.5	— 6.5	99	65.5
Chicago	86.5	— 6.5	96	75
Eastern Pa.	61	— 4	90.5	81
Youngstown	50	—10	86	60
Wheeling	82	— 5	93.5	90.5
Cleveland	96	+ 0.5	95	97
Buffalo	64	+10	88.5	93
Birmingham	41	— 4	99	85
New England	80	None	95	88
Cincinnati	85	—11	82	79
St. Louis	89.5	None	87.5	54
Detroit	101	— 3	92	88
Estimated national rate	73	— 5	95.5	74.5

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Apr. 17	Apr. 10	Month Ago Mar. 1948	Year Ago Apr. 1947	5 Years Ago Apr. 1943
Finished Steel	$81.14	$81.14	$81.14	$69.82	$56.73
Semifinished Steel	68.72	68.72	68.72	52.10	36.00
Steelmaking Pig Iron	39.18	39.18	39.34	32.49	23.00
Steelmaking Scrap	40.42	40.42	40.21	33.94	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Mar. 1948	3.57435c
Feb. 1948	3.54374c
Mar. 1947	3.10998c
Mar. 1943	2.43678c

*** STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide base prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading basing points), and on Steelworks Scrap (No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composite, dollars per net ton; pig iron and scrap, gross ton.

† FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, base prices, weighted by actual monthly shipments of following products, representing 82 per cent of total steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute; Structural shapes; plates; standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. March figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	April 17, 1948	Mar., 1948	Jan., 1948	Apr., 1947
Steel bars, Pittsburgh	2.90c	2.90c	2.90c	2.60c
Steel bars, del. Philadelphia	3.356	3.356	3.348	2.98
Steel bars, Chicago	2.90	2.90	2.90	2.60
Shapes, Pittsburgh	2.80	2.80	2.80	2.50
Shapes, del. Philadelphia	2.968	2.968	2.966	2.64
Shapes, Chicago	2.80	2.80	2.80	2.50
Plates, Pittsburgh	2.95	2.95	2.95	2.65
Plates, del. Philadelphia	3.19	3.19	3.186	2.85
Plates, Chicago	2.95	2.95	2.95	2.65
Sheets, hot-rolled, Pittsburgh	2.80	2.80	2.80	2.50
Sheets, cold-rolled, Pittsburgh	3.55	3.55	3.55	3.20
Sheets, No. 10 galv., Pittsburgh	3.95	3.95	3.93	3.55
Sheets, hot-rolled, Gary	2.80	2.80	2.80	2.50
Sheets, cold-rolled, Gary	3.55	3.55	3.55	3.20
Sheets, No. 10 galv., Gary	3.95	3.95	3.93	3.55
Strip, hot-rolled, Pittsburgh	3.05	3.05	2.80	2.50
Strip, cold-rolled, Pittsburgh	3.80	3.80	3.55	3.20
Bright basic, bess. wire, Pittsburgh	3.775	3.775	3.695	3.425
Wire nails, Pittsburgh	5.20	5.20	4.67	4.125
Tin plate, per base box, Pittsburgh	$6.70	$6.70	$6.70	$5.75

Semifinished

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$53.57	$44.64
Slabs, Pittsburgh, Chicago	45.00	45.00	40.18	37.506
Rerolling billets, Pittsburgh	45.00	45.00	40.18	37.506
Wire rod 7/32 to ¼-inch, Pitts.	3.175c	3.175c	3.10c	2.55c

Pig Iron

	April 17, 1948	Mar., 1948	Jan., 1948	Apr., 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$40.996	$40.996	$40.379	$34.83
Basic, Valley	39.00	39.00	38.40	33.00
Basic, eastern del. Philadelphia	42.004	42.004	41.372	35.52
No. 2 fdry., del. Pgh. (N.&S. sides)	40.496	40.496	39.879	34.33
No. 2 fdry., del. Philadelphia	42.504	42.504	41.871	36.02
No. 2 foundry, Chicago	39.00	39.00	38.60	33.00
No. 2 foundry, Valley	39.50	39.50	36.50	33.50
Southern No. 2, Birmingham	37.88	37.88	34.88	29.28
Southern, No. 2, del. Cincinnati	42.23	41.857	37.74	34.15
Malleable, Valley	39.50	39.50	38.90	33.50
Malleable, Chicago	39.50	39.50	39.10	33.50
Charcoal, low phos., fob Lyles, Tenn.	55.00	55.00	50.00	40.50
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.25	$40.30	$35.81
Heavy melt. steel, No. 2, E. Pa.	39.00	39.00	41.30	33.25
Heavy melt. steel, No. 1, Chicago	39.00	38.875	39.05	32.75
Heavy melt. steel, No. 1, Valley	40.25	40.25	40.04	34.56
Heavy melt. steel, No. 1, Cleveland	39.75	39.75	39.75	34.06
Heavy melt. steel, No. 1, Buffalo	43.00	44.00	43.30	34.25
Rails for rerolling, Chicago	49.50	49.625	60.00	38.25
No. 1 cast, Chicago	69.00	66.00	63.50	42.50

Coke

Connellsville, beehive furnace	$12.50	$12.50	$12.50	$9.06
Connellsville, beehive foundry	14.875	14.875	14.60	10.375
Chicago, oven foundry, del.	19.25	19.25	19.19	16.10

FINISHED AND SEMIFINISHED IRON STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46 per net ton, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56 per gross ton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45 per net ton; Cleveland, $47 per net ton; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54 per net ton.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom., per net ton; sales in open market $95-105 per gross ton.

Skelp: Pittsburgh, Youngstown, 2.90c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-70 per net ton; some sellers quoting up to $120 per gross ton.

Wire Rods: Pittsburgh, Chicago, Birmingham, 7/32 to ¼-inch, inclusive, $2.80-3.55 per 100 lb. 5/16 to 41/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, base, 20 tons one size, 2.90c; Detroit, del., 3.06c; eastern Mich., 3.13c; New York, del., 3.392c; Phila., del., 3.356c; San Francisco (base, del.), 3.6345-3.95c; Los Angeles (base, del.), 3.629-3.86c; Seattle, 3.8375-3.85c. base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.71c; Toledo, 3.78c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base 4.10c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.88c-4.18c base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

Iron Bars: Single refined: Pittsburgh 7.70c (hand puddled), Economy, Pa., 8.65c. Double refined: Pittsburgh 9.75c (hand puddled), Economy, Pa., 10.00c. Staybolt: Pittsburgh 11.25c (hand puddled), Economy, Pa., 10.20c.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Detroit, del., 2.96-3.01c; eastern Mich., del., 3.03-3.08c; Philadelphia, del., 3.04c; New York, del., 3.172c; Los Angeles (base, del.), 3.544c; San Francisco, (base, del.), 3.5495c, (Alan Wood Steel Co., Conshohocken, Pa., quotes 4.20c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.71-3.76c; Eastern Mich., del., 3.78c-3.83c; New York, del., 4.042c; Philadelphia, del., 4.006c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Canton, Middletown, 3.95c; Kokomo, 4.55c; Youngstown, 3.95-4.45c; Granite City, 4.35c; New York, del., 4.322c; Philadelphia, del., 4.19c; Los Angeles (base, del.), 4.724c; San Francisco (base, del.), 4.7295c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.55c; copper-iron or pure iron, 4.90c; Granite City 5.00c and 5.35c, respectively; copper alloy, 4.90c, Kokomo. Los Angeles (base, del.), 5.344c; San Francisco (base, del.), 5.3495c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Middletown, 3.95c; Youngstown 3.95c-4.45c; Granite City, 4.05c; Detroit, del., 4.11c; eastern Mich., 4.18c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c, **Armature:** Pittsburgh, 4.80c-5.30c; Chicago, Gary, 4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. **Electrical:** Pittsburgh, 5.30c-5.80c; Chicago, Gary, 5.30c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c. **Motor:** Pittsburgh, 6.05-6.80c; Chicago, Gary, 6.05c; Granite City, 6.50c.

Dynamo: Pittsburgh, 6.75c-7.00c; Granite City, 7.20c. **Transformer 72,** 7.25-8.25c; **65,** 7.95-9.20c; **58,** 8.65-9.90c; **52,** 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, 2.80c-3.30c; Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.96-3.01c; eastern Mich., del., 3.03-3.08c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3.60c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, 3.55c-4.05c; Cleveland, Youngstown, 3.55c-3.85c; Chicago base, 3.65c; Detroit, del. 3.71-3.76c; eastern Mich., 3.78-3.83c; Worcester, base, 3.75c-4.45c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c; over 0.60 to 0.80, 5.65c; over 0.80 to 1.05, 7.15c; over 1.05 to 1.35, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., per base box of 100 lb, 1.25 lb coating $6.60, 1.50 lb coating $6.80; Granite City, Birmingham, Sparrows Point, 1.25 lb coating $6.70, 1.50 lb coating $6.90.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., per base box of 100 lb, 0.25 lb tin, $5.80; 0.50 lb tin, $6.00; 0.75 lb tin $6.20; Granite City, Birmingham, Sparrows Point, $5.90, $6.10, $6.30, respectively.

Can Making Black Plate: Pittsburgh, Gary, Warren, O., per base box of 100 lb, 55 to 70 lb basis weight, $5.20; 75 to 95 lb basis weight, $5.10; 100 to 128 lb basis weight, $5.20.

Holloware Enameling Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage, 4.75c per lb; Granite City, Birmingham, Sparrows Point, 4.85c per lb.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, per base box of 100 lb, $5.90; Granite City, Birmingham, Sparrows Point, $6.00.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.50.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, (base, del.), 3.125c; Det., del., 3.21c; New York, del., 3.322c; Phila., del., 3.19c; Boston, del., 3.423c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.693c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.
(Central Iron & Steel Co., Harrisburg, Pa., 4.75c, basing points.)

Floor Plates: Pittsburgh, Chicago, Cleveland, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.80c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.088c; Phila., del., 2.968c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41-3.474c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.543c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.

Alloy Structural Shapes: Pittsburgh, Chicago, 3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)

Wire to Manufacturers in carloads	
Bright, basic or bessemer	*$3.55–4.00
Basic MB Spring (except Birm.)	**$4.95
Upholstery Spring (except Birm.)	†$4.60
Wire Products to Trade in carloads	
Wire, Merchant Quality	
Annealed (6 to 8 base)	††$4.20
Galvanized (6 to 8 base)	††$4.65
(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).	
Nails	
Standard, cement-coated, galvanized	‡94
Staples, polished and galvanized	‡194
Woven fence, 15½ gage and heavier	$100
Barbed wire, 80-rod spool	§§113
Fence Posts (with clamps)	107
Bale ties, single loop	$99

* Worcester, $3.65; Duluth, $3.60, base; San Francisco (base, del.), $4.56, bright basic only.
** Worcester, $5.05; Duluth & Trenton, N.J., $5.20 (bright only); San Francisco (base del.) $5.9845.
† Worcester $4.70; Duluth and Trenton, N. J., $4.85, base. San Francisco (base, del.) $5.6345 black upholstery.
†† One producer quotes 25 cents higher at Birmingham and Chicago; Worcester $4.30, annealed, $4.75, galvanized; Duluth $4.20, annealed, $4.65, galvanized; Kokomo, Ind., $4.80 annealed, $5.25 galvanized; San Francisco (base, del.) $5.21, annealed, $5.66 galvanized.
‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 100; Cleveland 97; San Francisco (base, del.) 115.
‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 100, San Francisco (base del.) 115.
§ San Francisco (base del.) 123.
§§ San Francisco (base del.) 133.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.
Relaying, 60 lb and over fob warehouse $60-$65 per net ton.
Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.65 per 100 lb, fob mill; $3.40 base, Seattle; $3.80 base, Pittsburg, Calif. Splice bars $3.85 per 100 lb, fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.50c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	44½	17	1	52½	36½
¼	44½	21½	1¼	53	37
⅜	41	17	1½	53½	37½
½	47	29½	2	54	38
¾	50	33½	2½ & 3	54½	38½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	44½	28	44	27½	43½	27
2½ & 3	48½	32	47	30½	46½	30
3½-6	50½	34	49	32½	48½	32

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	43½	1	51½
¼	43½	1¼	52
⅜	40	1½	52½
½	46	2	53
¾	49	2½ & 3	53½

In.	Lap Weld	Elec. Weld	Seamless
2	43½	43	42½
2½ & 3	46½	46	45½
3½-6	48½	48	47½
8	50½	50	49½
10	50	49½	49
12	49	48½	48

Standard Wrought Iron Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜	+46½	+74½	1¼	+12	+34½
½	+11	+35	1½	+ 6	+27½
¾	+ 1½	+25	2	— 1½	+20
1 and 1¼	— 4	+16½	2½-3½	— 4	+16
1½	— 9½	+13	4½-8	— 6	+12
2	—10	+12½	9-12	+ 3	+21½

Boiler Tubes: Net base prices per 100 ft. fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

O.D.		——Seamless——		—Elec. Weld—	
		Hot	Cold	Hot	Cold
Sizes	B.W.G.	Rolled	Drawn	Rolled	Drawn
1"	13	....	$12.46	$11.51	$11.51
1¼"	13	....	14.76	11.48	13.64
1½"	13	$14.00	16.47	12.69	15.22
1¾"	13	15.92	18.74	14.43	17.31
2"	13	17.84	20.99	16.17	19.39
2¼"	13	19.88	23.40	18.02	21.62
2¼"	12	21.90	25.77	19.86	23.80
2½"	12	23.99	28.21	21.75	26.06
2¾"	12	25.42	29.90	23.05	27.63
3"	12	26.68	31.40	24.18	29.00
3¼"	11	31.06	36.55	28.16	33.77
3½"	11	33.35	39.26	30.23	36.27
4"	10	41.40	48.70	37.53	44.99
4½"	9	54.87	64.58	....	....
5"	9	63.52	74.74	....	....
6"	7	97.51	114.73	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

Carriage and Machine Bolts	
½-in. and smaller; up to 6 in. in length	45 off
⅝ and ¾ x 6-in. and shorter	46 off
¾-in. and larger x 6-in. and shorter	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller	46 off	....
½-in. and smaller	....	44 off
½-in.-1-in.	44 off	....
⅝-in.-1-in.	....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	48 off
¾, ⅞, & 1 x 6 and shorter	44 off

Square Head Set Screws

Upset 1-in. and smaller	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural ½-in. and larger	5.65c
Lebanon, Pa.	.....5.65c plus 19c per cwt in cl., 26c lcl.
⅞-in. and under	55 off
Lebanon, Pa.	.....55 off plus 19c per cwt in cl., 26c lcl.

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, cents per lb, Pittsburgh and Washington, Pa.

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301	26.00c	29.50c	37.00c	22.00c	28.00c
302	26.00	29.50	37.00	23.50	30.50
303	28.50	31.50	39.00	29.50	36.00
304	27.50	31.50	39.00	25.50	32.50
308	31.50	37.00	44.50	31.00	38.00
309	39.00	43.50	51.00	40.50	51.00
310	53.50	56.50	57.50	53.00	61.00
316	43.50	48.00	52.00	43.50	52.00
321	31.50	37.00	44.50	32.00	41.50
347	36.00	41.50	49.00	36.00	45.50
431	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442, 443	24.50	28.00	35.50	26.00	35.00
446	30.00	33.00	39.50	38.00	56.50
†501	9.00	13.00	17.50	13.00	18.50
†502	10.00	14.50	18.50	14.50	19.50
‡STAINLESS CLAD STEEL (20%)					
304	....	24.00	22.00	....	....
410	....	22.00	20.00	....	....
430	....	22.50	20.50	....	....
446	....	29.00	27.00	....	....

† Low chromium. ‡ Fob Pittsburgh, Washington, and Coatesville, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

	Per Gross Ton			
	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$40.00	$40.50	$41.00	$41.50
Newark, N. J., del.	42.208	42.708	43.208	43.708
Brooklyn, N. Y., del.	....	44.10	44.60	....
Philadelphia, del.	42.004	42.504	43.004	43.504
Birmingham, base	35.88†	36.38†	....	....
Cincinnati, del.	....	42.23	....	....
Buffalo, base	40.00†	40.00†	40.50†	41.00
Boston, del.	47.776	47.776	48.276	....
Rochester, del.	42.22	42.22	42.72	43.22
Syracuse, del.	43.025	43.025	43.525	44.025
Chicago, base	38.50	39.00	39.50	40.00
Milwaukee, del.	40.08	40.58	41.08	41.58
Muskegon, Mich., del.	....	43.60	44.10	....
Cleveland, fob furnace	38.50†	39.00†	39.50†	40.00
Akron, del.	40.50	41.00	41.50	42.00
Duluth, base	39.00	39.50	40.00	40.50
Erie, Pa., base	38.50	39.00	39.50	40.00
Everett, Mass., base	....	45.00	45.50	....
Granite City, Ill., base	39.50	40.00	40.50	....
St. Louis, del.	40.25	40.75	41.25	....
‡**Neville Island, Pa., base**	39.00	39.50	39.50	40.00
Pittsburgh, del., N.&S. Sides	39.996	40.496	40.496	40.996
Provo, Utah, base	39.00	39.50	....	....
Seattle, Tacoma, Wash., del.	....	46.63	....	....
Portland, Oreg., del.	....	46.63	....	....
Los Angeles, San Francisco	46.13	46.63	....	....
Sharpsville, Pa., base	39.00	39.50	39.50	40.00
Steelton, Pa., base	40.00	40.50	41.00	41.50
Struthers, O., base	39.50	....	....	....
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Toledo, O., base	38.50	39.00	39.50	40.00
Cincinnati, del.	42.70	43.20	....	....
Youngstown, O., base	39.00	39.50	39.50	40.00
Mansfield, O.	42.57	43.07	43.07	43.57

† Republic Steel Corp. quotes $3 a ton higher at Birmingham, effective Jan. 1, 1948; Republic quotes $2.375 higher for No. 2 foundry and malleable and $1.875 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended Apr. 18.

‡ To Neville Island base add: 79.2c for McKees Rocks, Pa., $1.212 Lawrenceville, Homestead, McKeesport, Monaco; $1.788 Oakmont; $1.596 Verona; $1.788 Brackenridge; 99.6c to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)....$49.50
6.51-7.00..$50.75 9.01- 9.50. 57.00
7.01-7.50.. 52.00 9.51-10.00. 58.25
7.51-8.00.. 53.25 10.01-10.50. 59.50
8.01-8.50.. 54.50 10.51-11.00. 60.75
8.51-9.00.. 55.75 11.01-11.50. 62.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $77.50, Jackson, O.; $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$55.00 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $39.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.592, delivered. Intermediate phosphorus, Central furnace, Cleveland, $42.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$12.00-$13.00
Connellsville, foundry	14.00- 15.75
New River, foundry	12.50
Wise county, foundry	11.15
Wise county, furnace	10.65

Oven Foundry Coke

Kearney, N. J., ovens	$20.50
Chicago, outside del.	18.00
Chicago, del.	19.25
Terre Haute, ovens	18.50
Milwaukee, ovens	18.75
New England, del.	20.40-20.45
Birmingham, del.	15.76
Indianapolis, ovens	18.50
Cincinnati, del.	18.95
Ironton, O., ovens	16.75
Erie, Pa., del.	19.45
Painesville, O., ovens	18.10
Cleveland, del.	19.60
Buffalo, del.	20.15
Detroit, del.	19.00
Philadelphia, ovens	17.75
Swedeland, Pa., ovens	17.75
Portsmouth, O., ovens	17.00

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	12.50
Do., less than carlots	13.25
Do., tank cars	11.50

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	11.00

Per ton, bulk, fob plants

Sulphate of ammonia	$40.00

† Freight allowed up to 2 cents.

Refractories

Net Prices

Per 1000, fob shipping point

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$92.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	73.00
Ala., Ga.	73.00
N. J.	78.00

Intermediate Heat Duty

Ohio	67.00
Pa., Ill., Md., Mo., Ky.	67.00
Ala., Ga.	59.00
N. J.	70.00

Low-Heat Duty

Pa., Md., Ohio	59.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	50.00
Wire Cut	48.00

Malleable Bung Brick

All bases	83.00

Silica Brick

Pennsylvania	73.00
Joliet, E. Chicago	82.00
Birmingham, Ala.	73.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	64.00
Chem. bonded chrome	64.00
Magnesite brick	86.00
Chem. bonded magnesite	75.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	27.00
Single bags	31.50

Dolomite

Domestic, dead-burned, bulk, net tons, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50-14.00
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	28.50
50% no ratio	29.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.00
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheet, Hot-Rolled	4.30	4.30	4.30	4.30	4.30	4.30	...	...	...
Cold-Rolled	5.30	5.30	5.30	5.30	...	5.30	...	...	...
Galvanized	6.00	...	...	...	...	6.00	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.30	4.30	...	...	...	...	...
Cold-Rolled	5.30	5.30†	5.30†	5.30	...	...	...	...	...
Shapes, Structural	4.30	4.30	...	4.30	...	...	4.30	...	...
Plates	4.55	4.55	4.55	...	4.55	...	...	...	...
Bars, Small Shapes	4.45	4.45	4.45	4.45	...	4.45	...	4.45	4.45

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½"& up	H-R Alloy (**4140)	Structural Shapes	Carbon ⅜"-¾"	Floor ⅜" & Thicker
Boston (city)	5.03	6.09[4]	5.79[4]	6.23[4]	7.58[4]	5.61	6.87	5.04	5.88	7.64	4.91	5.18	6.86
New York (city)	4.96	6.16	5.86	6.16	7.51	5.59	...	5.06	5.63	7.23	4.80	5.11	6.78
New York (country)	4.81	6.01	5.71	6.01	7.36	5.44	...	4.91	...	...	4.65	4.96	6.63
Philadelphia (city)	4.70	6.32	5.92	5.90	7.25	5.32	5.72	4.87	5.75	8.77	4.57	4.85	6.47
Philadelphia (country)	4.55	6.18	5.78	5.75	7.10	5.17	5.57	4.73	...	...	4.47	4.71	6.32
Baltimore (city)	4.32†	5.95	5.65	5.72	7.07	4.80	...	4.85	5.71	...	4.71	4.77	6.30
Baltimore (country)	4.17†	5.80	5.50	5.50	6.85	4.65	...	4.70	...	...	4.56	4.62	6.15
Washington (city)	4.81	...	...	...	...	5.08	...	5.14	5.79[13]	...	4.98	5.03	6.60
Washington (country)	4.71	...	...	...	...	4.98	...	5.04	...	...	4.88	4.93	6.50
Norfolk, Va.	4.90	...	...	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis, Tenn. (city)	4.82[20]‡‖	5.87[20]†	...	6.37	...	5.02[20]	...	4.97[20]	5.87	...	4.97[20]	5.17[20]	6.87[20]
Memphis, Tenn. (country)	4.72[20]‡‖	5.77[20]†	...	6.27	...	4.92[20]	...	4.87[20]	5.77	...	4.87[20]	5.07[20]	6.77[20]
Buffalo (city)	4.45	...	5.20[3]	6.05	...	5.25	5.65	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (country)	4.30	...	5.05[3]	5.80	...	4.70	5.50	4.25	4.95	6.85	4.25	4.45	5.75
Pittsburgh (city)	4.25‡‖	...	5.10[3]†	5.65	6.90	4.35	5.35	4.40	5.10	6.85	4.40	4.60	5.90
Pittsburgh (country)	4.10‡‖	...	4.95[3]†	5.50	6.75	4.20	5.20	4.25	4.95	6.85	4.25	4.45	5.75
Cleveland (city)	4.45	5.50[3]	5.20[3]	5.82	7.17	4.55	5.35	4.40	5.10	7.26	4.70	4.60	6.05
Cleveland (country)	4.30	5.35[3]	5.05[3]	...	...	...	5.20	4.25	4.95	...	...	4.45	5.90
Cincinnati	4.56	...	5.22	5.77	...	4.77	...	4.78	5.63	...	4.82	4.98	6.47
Detroit	4.55	...	5.30	...	...	4.72	5.63	4.50	5.22	7.10	4.77	4.88	6.28
Indianapolis	4.55	5.32[3]	...	5.87	7.12	4.65	5.90	4.70‡‡	5.40	8.85	4.70	4.90	6.35
Chicago (city)	4.45	5.50[3]	5.20[3]	5.65	6.90	4.35	5.45	4.40	5.10	6.85[9]	4.40	4.60	6.05
Chicago (country)	4.30	5.35[3]	5.05[3]	5.50	6.75	4.20	5.30	4.25	4.95	6.85[9]	4.25	4.45	5.90
Milwaukee	4.658	5.708[3]	5.408[3]	5.858	7.108	4.558	5.658	4.608	5.308	7.208[9]	4.608	4.808	6.258
St. Louis	4.78	5.83[3]	5.53[3]	6.02	7.27	4.68	5.82	4.73	5.47[13]	...	4.73	4.93	6.38
Birmingham (city)	4.45[20]‡‖	...	...	5.65	...	4.45[20]	...	4.40[20]	5.93[22]	...	4.40	4.65	6.86
Birmingham (country)	4.30[20]‡‖	...	...	5.50	...	4.30[20]	...	4.25[20]	...	...	4.25	4.50	...
New Orleans	4.98[20]**	...	6.29[18]	...	...	5.18[20]	...	5.13[20]††	6.29[11]	...	5.03[20]††	5.33[20]	7.29[20]
Omaha, Nebr.	5.462	...	...	6.712	8.012	5.362	...	5.412	6.112	7.562	5.412	5.612	7.062
Houston, Tex.	5.75	...	...	7.36	8.10	6.00	...	5.35	7.00[13]	...	5.85	5.85	6.50
Los Angeles (city)	5.75	7.75[3]	7.45[3]	7.40	8.80	6.05	8.70	5.50	7.35[23]	9.35[19]	5.35	5.55	7.65
Los Angeles (country)	5.60	7.60[3]	7.30[3]	7.25	8.65	5.90	8.55	5.35	7.20[1]	9.20[19]	5.20	5.40	7.50
San Francisco	5.40[21]	6.65[3]	...	7.05[3]	7.95[3]	5.75[21]	8.70[18]	5.05[21]	7.00[12]	...	5.30[21]	5.50[21]	7.10[21]
Seattle, Tacoma, Wash.	5.30[17]‡‖	...	7.10[3]‡	6.95	...	5.60[17]	...	5.45[17]	7.45[19]	8.50[12]	5.25[17]	5.55[17]	7.65[17]
Portland, Oreg.	5.30[17]‡‖	...	7.10[3]‡	6.70	...	5.60[17]	...	5.45[17]	7.45[19]	...	5.25[17]	5.45[17]	7.55[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [13]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [23]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $52, Palmerton, Pa., $51, Pittsburgh, 16% to 19% Mn., $51, Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. **West Coast Prices:** Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade: (Mn 90% approx., C 0.07% max., P 0.06% max.).** Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.8c for l.c.l.; Western, add 0.8c for c.l. and 2.5 for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l.,8MxD, bulk 20.1c per lb of contained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D, packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight alowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si. carload packed 10.9, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained, Si carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Aprox. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots, 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c ton lot 14.0c, less ton 14.9c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

(*Continued on Page 154*)

Metal Price Tone Strengthens

Platinum and certain secondary aluminum ingot prices advance. Production of refined copper establishes new all-time high. Zinc stocks decline further

NEW YORK — A stronger toned price trend developed in nonferrous metals last week. All major primary metal prices held unchanged, while platinum advanced $12 an ounce and certain secondary aluminum ingot prices showed some fractional gains.

COPPER — Shipments of refined copper to domestic consumers increased 16,165 tons in March to a total of 122,988 tons, a new high since March of last year when they totaled 123,382 tons. Of total shipments last month, 121,992 tons were delivered by industry sources and 996 tons by the Office of Metals Reserve. In addition, 168 tons were exported.

Production of refined copper increased 17,298 tons last month to 110,886 tons, setting a new all-time high record. The previous record was 105,589 tons established in July, 1943. Production of crude copper held steady at 73,387 tons by primary sources and 10,187 by secondary sources, or a total of 83,574 tons compared with 82,959 tons in the month of February.

Stocks of refined copper at the end of March totaled 68,582 tons compared with 70,146 tons at the end of the preceding month and 83,736 tons at the end of March, 1947.

With production sustained at a high rate, competition for red metal scrap continues strong. Some refiners advanced their bids for No. 1 copper scrap 1/4-cent last week to 19.00c, others holding unchanged at 18.75c. No. 2 copper rose to a range of 17.75c to 18.00c; light copper, 16.75c to 17.00c. Despite the higher bids, the flow of material remained well below requirements.

ZINC—Stocks of slab zinc dropped to only 45,229 tons last month from 48,229 tons at the end of February, according to the American Zinc Institute. Shipments increased to 76,241 tons in March from 73,241 tons in February and included 64,241 tons to domestic users, 8298 tons for export account, and 3702 for government account. Production rose to a daily average rate of 2362 tons in March from 2303 in February, totaling 73,209 tons and 66,784 tons, respectively. Unfilled orders at the end of last month totaled 61,610 tons compared with 72,224 tons a month earlier.

LEAD — The record high price for lead has begun to attract substantial tonnages of foreign metal to the American market. Australian producers have contracted for the sale of about 25,000 tons of refined lead to United States industrial users at a quotation equivalent to 17.50c, including import duty of 1-1/16 cents a pound. Shipment is to start this month. The purchase is equal to about two and one-half times the United States imports from Australia in 1947 when the total was 10,638 tons. The high lead price also has stimulated the movement of lead scrap to secondary smelters plus an improvement in the amount of lead concentrates going to the primary refiners.

TIN — Stocks of pig tin held by the Office of Metals Reserve which are available for sale declined to 26,815 tons as of Mar. 31 compared with 27,086 tons as of Feb. 28.

ALUMINUM—Due to the difficulty which refiners are experiencing in buying scrap aluminum at recently prevailing levels, they have revised their price schedules upwards on certain grades of secondary ingot. Tightness in the scrap market is attributed to large-tonnage buying by primary aluminum producers. Prices now quoted for No. 12 aluminum, No. 2 grade, range from 16.00c to 16.75c; prices currently quoted for No. 122 type piston alloy have a spread of 16.25c to 17.00c.

PLATINUM — Price of platinum advanced $12 an ounce last week to $98 for bulk quantities and $101 for retail lots. This is the highest price since the beginning of 1927 when the price was quoted at about $105. Industrial demand has been particularly heavy and it is again hoped by the trade that the latest advance will bring in additional supplies from Russia and other foreign sources of the metal.

Transport Difficulties Cut Zinc Flow

(*Concluded from Page* 48)

60,000; less exports of metal, 120,000. Supply for the western world outside the United States included production, in short tons, of 180,000 tons in Canada, 150,000 tons in Belgium, 80,000 in Australia, 75,000 in United Kingdom, 60,000 in Mexico, 54,000 in France, 42,000 in Norway.

The amount available for consumption by the Russian bloc, estimated at 296,000 tons, included 280,000 tons production, 40,000 tons of imported metal, less 24,000 tons exported. Mr. Strauss stressed the fact that the "iron curtain" is almost entirely effective with respect to data on the production, consumption and stocks of metals.

Sustained Demand — Commenting on the question of demand, he said "it would appear reasonable to anticipate that the world outside the Russian zone and the United States can readily continue to absorb 800,000 tons of metallic zinc a year, which is the apparent rate of such consumption in 1947. . . . A sustained consumption of 700,000 tons a year for a period of several years must be regarded as a satisfactory level in the United States. . . . The total of 1,500,000 tons leaves a substantial margin of metal production available for channeling into the United States stockpile." While the stockpile objective has not been published, it is believed that the government authorities are "thinking in terms of a stockpile of 800,000 or 1 million tons."

Mr. Mechin concluded his address by describing the trend in the shift in recoverable zinc production among the eastern, central and western states areas "which took place during World War II, became noticeable as early as 1943, became quite marked in 1947, and bids fair to become even more marked in 1948." Production in the central states accounted for 222,000 tons per year or 39 per cent of the total in the 1935-39 period, dropped to 132,000 tons, or 21.1 per cent of the total in 1947, and is expected to drop further to 91,000 tons, or only 14.7 per cent, in 1948. The western states, which accounted for 170,000 tons a year, or 30 per cent of the total, in the 1935-39 period, increased output to 334,198 tons, or 53.5 per cent in 1947 and are expected to increase it further to 369,000 tons, or 59.4 per cent, in 1948. Production in the eastern states amounted to 172,000 tons per year, or 31 per cent, in 1935-39 period, compared with 158,810 tons, or 25.4 per cent, in 1947, and an estimated 161,000 tons, or 25.9 per cent of the total, in 1948.

Among the speakers heard at the meeting of the Galvanizers Committee were: A. T. Baldwin, chemical engineer, Hanson-Van Winkle-Munning Co.; S. S. Johnston of the Weirton Steel Co., Weirton, W. Va. Mr. Baldwin concluded his address on "Progress of Fluxing in Hot Galvanizing" as follows:

"The progress of fluxing in hot galvanizing has been pointed out as progress in the use of fluxing agents. One new type of flux and process is in its infancy today. The real progress has been in a fuller understanding of the importance of thoroughness and care in each of the steps taken in preparation of the work for the actual hot-dipping. Experience with zinc ammonium chloride type fluxes opens the door for sheet galvanizers to use these controls in solving their operating problems."

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted.)

Copper: Electrolytic, 21.50c, Conn.; Lake, 21.62½c, Conn.

Brass Ingot: 85-5-5-5 (No 115) 19.25-19.50c; 88-10-2 (No. 215) 28.00c; 80-10-10 (No. 305) 24.25c; No. 1 yellow (No. 405) 15.25-16.00c. Prices include 25 cents per 100 lb freight allowance.

Zinc: Prime western 12.00c, brass special 12.25c, intermediate 12.50c, East St. Louis; high grade 13.00c, delivered.

Lead: Common 17.30-17.35c; chemical and corroding 17.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00c, pigs 14.00c; metallurgical 94% min. 13.50c. Base prices for 10,000 lb and over, delivered.

Secondary Aluminum: Piston alloy (No. 122 type) 17.50-18.00c; No. 12 foundry alloy (No. 2 grade) 17.00-17.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00-18.25c; grade 2, 17.25-17.75c; grade 3, 16.75-17.00c; grade 4, 16.00-16.50c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) 94.00c; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, 93.85c; grade C, 99.65-99.79%, incl., 93.50c; 99.5-99.64% 93.50c; grade F, 98-98.99% 92.60c for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American, 99-99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 33.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 33.75c; 25-lb pigs, 35.25c; shot, 36.25c; "F" nickel shot or ingots, for addition to cast iron, 34.25c. Prices include import duty.

Mercury: Open market, spot, New York, $75-$77 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.75, del.; special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $98-$101 per ounce.

Palladium: $24 per troy ounce.

Iridium: $105-$115 per troy ounce.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 22.00c; 5 tons and over 22.50c; 1 to 5 tons, 23.00c; less than 1 ton, 23.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 15.00c; 1000 to 19,900 lb, 14.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c, 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 23.50c; 275-lb, or 500 bbls. 21.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 110.00c; 500 to 999 lb, 110.50c; 200 to 499 lb, 111.00c lb, 111.00c; less than 200 lb, 112.50c; ball, 1000 lb and over, 112.25c; 500 to 999 lb. 112.75c; 200 to 499 lb, 113.25c; less than 200 lb, 114.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers and resellers, 67.4c; 100 or 300 lb drums only, 100 to 500 lb, to consumers 59.2c, to resellers 54.8c; 600 to 1900 lb, to consumers 56.8c, to resellers 52.5c; 2000 to 9900 lb, to consumers 55.0c, to resellers 50.9c; 10,000 lb or more l.c.l., to consumers 53.9c, to resellers 49.9c; carloads, to consumers 52.7c, to resellers 48.7c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Potassium Stannate: 350 to 1050 lb, 65.00c; 1400 to 2100 lb, 62.50c; 2450 lb and more, 61.50c.

Stannous Sulphate: Less than 2000 lb, 94.00c; more than 2000 lb, 93.00c.

Stannous Chloride (anhydrous): 400 lb-bbls, 89.00c; 100-lb kegs, 90.00c per lb.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, fob mill.)

Sheet: Copper 33.68c; yellow brass 30.16c; commercial bronze, 95% 33.80c, 90% 33.27c; red brass, 85% 32.23c, 80% 31.70c; best quality 31.09c; Everdur, Duronze, Herculoy or equiv., hot-rolled, 38.56c; nickel silver, 18%, 42.42c; phosphor bronze, grade A, 5%, 52.70c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.69c; commercial bronze, 95% 33.49c, 90% 32.96c; red brass, 85% 31.92c, 80% 31.39c.

Seamless Tubing: Copper 33.72c; yellow brass 32.92c; commercial bronze 90% 35.68c; red brass 85% 34.89c, 80% 34.36c.

Wire: Yellow brass 30.45c; commercial bronze, 95% 34.09c, 90% 33.56c; red brass, 85% 32.52c, 80% 31.99c; best quality brass 31.38c.

Copper Wire: Bare, soft, fob eastern mills, c.l. 26.80c, l.c.l. 27.30c; weatherproof, fob eastern mills, c.l. 27.35c, l.c.l. 27.85c; magnet, delivered, c.l. 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, l.c.l. 30.50c-31.88.

ALUMINUM

(Base prices, fob shipping point)

Sheets and Circles: 2s and 3s mill finish c.l., fob shipping point.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12-24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $20.85 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $20.10 per cwt; cut coils, $20.35. Traps and Bends: List price plus 52%.

ZINC

Sheet, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 54.00c. Strip, cold-rolled, 60.00c. Rods, hot-rolled 50.00c, cold-finished 55.00c. Angles, hot-rolled, 50.00c. Plates, 52.00c. Seamless tubes, 83.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 43.00c; No. 35, 41.00c. Strip, cold-rolled, 44.00c. Rods, hot-rolled 39.00c; cold-finished 44.00c, Angles, hot-rolled, 39.00c. Plates, 41.00c. Seamless tubes, 71.00c. Shot and blocks, 31.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 5%	16.500	16.250	8.250
Phos. bronze, A. B.	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.00, No. 2 copper 17.00, light copper 16.00, composition red brass 15.25, auto radiators 12.25, heavy yellow brass 11.25, brass pipe, 12.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.75-19.00, No. 2 copper 17.75-18.00, light copper, 16.75-17.00, refinery brass (60% copper), per dry copper content 16.50-16.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.25-16.75, No. 2 15.50-16.00, light copper 14.25-14.75, No. 1 composition red brass 12.50-13.00, No. 1 composition turnings 12.00-12.50, mixed brass turnings 7.50-7.75, new brass clipping 12.50-13.00, No. 1 brass rod turnings 10.00-10.50, light brass 6.50-7.00, heavy yellow brass 9.00-9.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 9.75-10.25, cocks and faucets 9.75-10.25, brass pipe 9.75-10.25.

Lead: Heavy 15.00-15.25, battery plates 9.25, linotype and stereotype 16.00-16.50, electrotype 13.50-14.00, mixed babbitt 14.25-14.75, solder joints, 17.75.

Zinc: Old zinc 5.50-5.75; new die cast scrap 4.75-5.25, old die cast scrap 2.75-3.25.

Tin: No. 1 pewter 60.00-62.00, block tin pipe 77.00-78.00, auto babbitt 47.00, No. 1 babbitt 48.00, siphon tops 45.00-47.00.

Aluminum: Clippings 2S 9.00-9.50, old sheets 7.00-7.50, crankcases 7.00-7.50, borings and turnings 2.50-3.00, pistons, free of struts, 6.00-6.50.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
March Average:	21.500	14.825	12.000	94.000	15.000	33.000	33.750	74.625
Apr. 1-3	21.500	14.80-14.85	12.000	94.000	15.000	33.000	33.750	74.625
Apr. 5-15	21.500	17.30-17.35	12.000	94.000	15.000	33.000	33.750	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Busheling	40.00-40.50*
Nos. 1, 2 & 3 Bundles	40.00-40.50*
Machine Shop Turnings	36.00-36.50
Mixed Borings, Turnings	36.00-36.50
Short Shovel Turnings	36.50-37.50
Cast Iron Borings	36.00-37.00
Bar Crops and Plate	47.50-48.00
Low Phos. Steel	47.50-48.00
Heavy Turnings	40.50-41.00

Cast Iron Grades

No. 1 Cupola	65.50-66.50
Charging Box Cast	48.00-49.00
Heavy Breakable Cast	48.00-49.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	52.00-53.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-57.00
Rails, Random Lengths	60.00-61.00
Rails, 3 ft and under	61.50-62.00
Rails, 18 in. and under	62.50-63.50
Railroad Specialties	54.00-55.00
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

*Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Busheling	39.50-40.00*
Nos. 1 & 2 Bundles	39.50-40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.00-36.00
Short Shovel Turnings	35.50-36.00
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Heavy Turnings	39.50-40.50
Alloy Free Turnings	37.50-38.50
Cut Structurals	46.00-49.00

*Plus applicable freight springboard.

Cast Iron Grades

No. 1 Cupola	68.00-70.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-78.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*
R.R. Malleable	73.00-78.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	61.00-63.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	56.00-57.00
Angles, Splice Bars	57.00-59.00

*Plus applicable freight spring board.

VALLEY

No. 1 Heavy Melt. Steel	40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Bundles	40.00-40.50*
Machine Shop Turnings	34.50-35.50
Short Shovel Turnings	36.50-37.00
Cast Iron Borings	36.00-36.50
Low Phos.	46.00-47.50

* Plus applicable freight springboard.

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*

*Plus applicable freight spring board.

MANSFIELD

Machine Shop Turnings	$35.00-35.50
Short Shovel Turnings	37.00-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	55.00
Charging Box Cast	43.00
Heavy Breakable Cast	50.00
Stove Plate	47.00
Unstripped Motor Blocks	45.00
Brake Shoes	45.00
Clean Auto Cast	55.00
Drop Broken Cast	60.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50
R.R. Malleable	68.00
Rails, Rerolling	53.00
Rails, Random Lengths	50.00
Rails, 18 in. and under	60.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 1 Busheling	35.00-35.50
Nos. 1 & 2 Bundles	35.00-35.50
No. 3 Bundles	35.00-35.50
Machine Shop Turnings	29.00-29.50
Mixed Borings Turnings	29.00-29.50
Short Shovel Turnings	30.00-30.50
Cast Iron Borings	30.00-30.50
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	60.00-62.00
Heavy Breakable Cast	50.00-52.00
Clean Auto Cast	62.00-65.00

BUFFALO

No. 1 Heavy Melt. Steel	$42.00-44.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
No. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	34.75-35.25
Mixed Borings, Turnings	34.75-35.25
Cast Iron Borings	35.75-36.26
Short Shovel Turnings	36.75-37.25
Low Phos.	44.75-46.00

Cast Iron Grades

No. 1 Cupola	62.50-63.50
Mixed Cupola	58.00-60.00
Heavy Breakable Cast	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under	56.00-58.00
Railroad Specialties	52.00-53.00

PHILADELPHIA

No. 1 Hvy. Melt. Steel	$41.50-42.50
No. 2 Hvy. Melt. Steel	39.00
No. 1 Busheling	39.00
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings	34.00-35.00
Bar Crop and Plate	44.50-45.50
Punchings & Plate Scrap	44.50-45.50
Cut Structurals	44.50-45.50
Elec. Furnace Bundles	43.50-44.50
Heavy Turnings	42.50-43.00
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	62.00-64.00
No. 1 Machinery Cast	66.00-67.00
Charging Box Cast	61.00-61.50
Heavy Breakable Cast	61.00-61.50
Unstripped Motor Blocks	59.50
Malleable	74.00-76.00
Clean Auto Cast	62.00-64.00
No. 1 Wheels	67.00-68.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.03
No. 2 Heavy Melt. Steel	34.03
No. 1 Busheling	34.03
Nos. 1 & 2 Bundles	34.03
No. 3 Bundles	32.03
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings	30.50-31.00
Punchings & Plate Scrap	39.00-40.00
Cut Structurals	39.00-40.00
Elec. Furnace Bundles	39.00-40.00

Cast Iron Grades

No. 1 Cupola Cast	54.00-56.00
Charging Box Cast	54.00-55.00
Heavy Breakable	54.00-55.00
Unstripped Motor Blocks	51.00-53.00
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.40-31.90
No. 2 Heavy Melt. Steel	31.40-31.90
No. 1 Bundles	31.40-31.90
No. 1 Busheling	31.40-31.90
Machine Shop Turnings	26.90
Mixed Borings, Turnings	26.90
Short Shovel Turnings	28.90
Bar Crops and Plate	35.00-37.00
Punchings & Plate Scrap	35.00-37.00
Chemical Borings	34.00-35.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-60.00
Heavy Breakable Cast	50.00-53.00
Stove Plate	52.00-55.00
Unstripped Motor Blocks	48.00-49.00
Clean Auto Cast	48.00-50.00

CHICAGO

No. 1 Heavy Melt Steel	$38.50-39.50
No. 2 Heavy Melt. Steel	38.50-39.50
No. 1 Bundles	38.50-39.50
No. 2 Bundles	38.50-39.50
No. 3 Bundles	36.50-37.50
Machine Shop Turnings	33.50-34.50
Mixed Borings, Turnings	33.50-34.50
Short Shovel Turnings	35.50-36.50
Cast Iron Borings	34.50-35.50
Bar Crops and Plate	46.00-47.00
Punchings	47.50-48.50
Elec. Furnace Bundles	39.50-40.50
Heavy Turnings	38.00-39.00
Cut Structurals	43.50-44.50

Cast Iron Grades

No. 1 Cupola Cast	68.00-70.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	54.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.25-41.75
Malleable	71.00-73.00
Rails, Rerolling	49.00-50.00
Rails, Random Lengths	46.50-47.50
Rails, 3 ft and under	55.00-56.00
Rails, 18 in. and under	57.00-58.00
Railroad Specialties	49.00-50.00
Angles, Splice Bars	50.00-51.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$39.50-40.50
No. 2 Heavy Melt. Steel	37.50-38.50
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	60.00-62.00
Heavy Breakable Cast	53.00-55.00
Brake Shoes	54.00-55.00
Clean Auto Cast	64.00-66.00
Burnt Cast	58.00-59.00

Railroad Scrap

R.R. Malleable	65.00-70.00
Rails, Rerolling	50.50-52.50
Rails, Random Lengths	49.50-51.50
Rails, 3 ft and under	53.00-55.00
Uncut Tires	46.00-47.00
Angles, Splice Bars	46.00-48.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	31.00
Long Turnings	24.50
Short Shovel Turnings	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	38.50
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	51.00
Stove Plate	43.00
No. 1 Wheels	45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	45.00
Axles, Steel	39.00
Rails, Rerolling	52.00
Rails, Random Length	39.00
Rails, 3 ft and under	41.00
Angles and Splice Bars	41.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*20.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	20.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	14.50-16.50
Mixed Borings, Turnings	14.50-16.50
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	25.00
Heavy Breakable Cast	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	30.00
No. 1 Wheels	26.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melting	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-45.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

Sheets, Strip . . .

One producer advances Detroit, eastern Michigan arbitraries $1 on sheet and strip

Sheet Prices, Page 130

Pittsburgh — Sheet and strip output has not yet been adversely affected as a result of the cut-back in primary steel output. Mills have had a relatively large inventory of slabs and coils, and are channeling a larger portion of steel output into production of sheets and tin plate. Sellers are unwilling to predict whether or not sheet and strip rolling schedules can be maintained over the next week to ten days should coal mining operations remain at the current low levels reported through most of last week. Slab inventories are rapidly being depleted and it is not at all improbable that further cuts in steel output may result unless coal output is substantially increased. Pressure for sheet and strip deliveries has been more severe in recent weeks, with customers doing everything possible to obtain their allotments in advance of possible curtailment in production. The slight easing in overall requirements for electrical sheets, for example, has been reversed in recent weeks. Similar improvement is also noted in demand for stainless sheets.

It became known last week that one important producer increased its Detroit and eastern Michigan arbitrary prices $1 per ton on hot-rolled sheets and strip. Other producers are expected to take similar action.

Boston — Among flat-rolled products only stainless might be classified as being on a competitive basis. Sales involve some tie-in volume and the waiving of No. 100 grit finish extra to meet competition. Demand for other grades of sheets and strip exceeds supply, although there are scattered cutbacks on electrical sheets for small motors. However, allocations for third quarter of electrical sheets are taken up and demand for silicon material in coils is heavy. Most mills will enter the third quarter with carryovers of two to three weeks. Some range builders are less active but easing in demand for cold-rolled and enameling sheets is slight. Most stamping shops are seeking additional tonnage to supplement allocations, while steel at other shops has been acquired through customers. Hot-rolled strip schedules for cold reduction have been set back and considerable re-scheduling will result. Narrow cold strip carryover at the end of this quarter will be heavy.

New York — Although soft coal miners are returning to work, sheet producers look for the mine strike to have an adverse effect on finishing operations for some time. In fact, some producers believe that the effect of the coal shortage will be more noticeable in rolling mill operations later on than it actually is at present. They point out that it usually takes a few weeks for a prolonged strike, such as has been experienced, to be fully reflected in finishing operations.

Philadelphia — While May 1 has been the aim of most sheet sellers for setting up third quarter quotas, it appears now that few will be able to hit the mark, because of effects of the recent coal strike. Some believe they may come fairly close, assuming no further disturbances, but consumers say they will count themselves lucky if they know where they stand by the middle of May. Most consumers are becoming reconciled to the possibility of a further reduction in their quotas, because of the amount of back tonnage that the mills will have to carry into the next quarter, also because of the probability of a tightening in supply for defense purposes. Requirements of sheets for these purposes should not be as large as for some of the heavier products, but the impact will be felt nevertheless, if for no other reason than the diversion of raw steel from the light to the heavy products that will be necessary.

Chicago—Recent coal strike has increased pressure for sheets and strip, although production of these flat-rolled items was affected only to a minor degree in this district. Consumers believe they are bound to suffer from slackened steelmaking operations and that the sheet and strip situation will be tighter than previously expected over the balance of the year. Demand accruing from an expanding national defense program is expected also to aggravate present shortage and it can not now be determined how extensive voluntary allocation programs may be. Gray market activity, previously waning, has been given new impetus. A local sheetmaker which recently opened the second half books for conversion tonnage reports that requests so far have been in a volume which indicates that total demand will exceed available capacity.

Cincinnati — Sheet mills here deferred curtailment by eating deeply into reserves. A blast furnace at Martin's Ferry, banked Apr. 5, may get coke in time for proposed resumption by Apr. 24. Two furnaces at Ashland, Ky., had been slated to go down soon if coal miners had remained out of the pits, but will likely continue in blast. Reliance on scrap, to bolster tonnage, has been heavier. Meanwhile, inquiries bearing stamp of military preparedness have increased, but so far orders have not been in volume to disrupt schedules.

Birmingham — Pinch in sheets, already more pronounced here than at any time in history, has been intensified since the Fairfield mill went out of production Apr. 9 because of the coal strike. Pressure for delivery has increased.

Iron Ore . . .

Iron Ore Prices, Page 132

Cleveland—Lake Superior iron ore shipments from upper lake ports totaled 1,298,629 tons during the week ended Apr. 12 compared with only 125,626 tons in the like 1947 week, according to the Lake Superior Iron Ore Association, this city. Cumulative total for the season to Apr. 12 is 1,361,421 tons compared with 150,489 tons a year ago. Shipments for the week ended Apr. 12 included 1,293,657 tons from United States ports, all ports contributing the average daily loading of 184,808 tons, and 4972 tons from the Canadian port of Michipicoten. At this time a year ago only Escanaba and Two Harbors had reported shipments.

Steel Bars . . .

Leading producers will have larger unfilled orders at end of current quarter

Bar Prices, Page 130

New York—Hot carbon bar sellers assert that effects of the recent coal strike will be reflected in third quarter quotas. The carry-over at the end of this quarter will be substantially heavier than at the end of the last period. Thus in all probability the new quotas for third quarter will be substantially down from the present. One large interest doubts if he will be able to enter more than a month's production of new work in the next quarter. Cold-drawn carbon bars and alloy bars, particularly the former, likewise will reflect disruption created by the coal strike. However, the situation in these is not anywhere near as stringent as in hot carbon bars.

Boston—Although more consumers and distributors are better inventoried on cold-drawn carbon bars, the overall outlook for bar stock ahead has tightened because of production losses. This is more apparent in bessemer cold-drawn bars and limited supply of hot-rolled carbon is forcing some substitutions. There is some tie-in volume with flat-rolled involving cold-finished and to some extent alloys; this accounts for some heavier inventories of the former. Distributors are not experiencing the lift in alloy demand noted by primary sellers. Screw machine products and forgings account for substantial bar activity. Tool steel is in balance with demand and most sellers of that product are seeking orders.

Philadelphia — Hot carbon bar mills had looked for the current quarter to be one of the best producing periods this year. With scrap beginning to flow more freely and various other handicaps of the winter season over, the period was regarded as one for not making up much lost ground, but for cushioning the slack in production that usually sets in in the third quarter as a result of hot weather and vacations. The coal strike blasted hopes along that line. Hence, the mills are further behind on their deliveries than ever.

In general, they look for an even tighter situation in the third quarter, especially with the armament program likely to get well under swing by that time. Alloy-bar promises already reflect the tightening of defense preparations, and also cold-drawn bar schedules in a lesser degree. However, these lines are still quite competitive, and especially in cold-drawn steel. Forging demand has not yet picked up appreciably, but this situation should change rapidly over the next several months.

St. Louis — Pressure for deliveries of small sized merchant bars is increasing more than seasonally. Demand for bars 1-inch and smaller is especially great from manufacturers of small tools and farm implements and from machine shops. Deliveries

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generally are four to five months behind, with the priorities given the railroad car program promising to increase the lag soon. Barmakers here have been asked by the government to increase their shipments for car work. Existing facilities already are loaded to capacity and acceptance of any more car tonnage merely would sidetrack fabricators' orders. So far, mills have kept current on rail car deliveries. Bar output last week was slowed a trifle because of poorer quality of coal due to the mine strike.

Plates . . .

Plate Prices, Page 131

Boston — More ground has been lost in plate schedules and third quarter tonnage to fabricators will be reduced by carryovers; prospect is for the blanking out of at least one month. Distribution of plate tonnage borders on the chaotic, the culmination of selective selling, price ranges, an increasing postwar demand far in excess of expectations, production losses and a maze of lesser developments. Carbon plates are the center of this confusion and mills taking this type of tonnage at the lower range of prices are heavily loaded with a substantial pending increase in shipbuilding requirements. Long-estabished trade reationships have been abandoned, due in part to the fact that some producers are engaging in the fabrication of end products from plates rather than customary material, thereby reducing the volume of plates available to other users. There has been no rush for the 3815 tons, hull steel black and galvanized wanted by the Navy; two galvanizers quoted on part of the tonnage and two mills also, but none bid for all: but two mills quoted on 150 tons of floor plates.

New York — Plate mill operations are getting back into better swing, following the settlement in the coal dispute, but it will still be some time before production is back to where it was before the mine walkout. Producers see little possibility of going into third quarter with much more than a month's production available for new specifications; in other words, their arrearages will be substantially heavier than they were at the beginning of the current quarter. Meanwhile, demand is expanding as a result of increasing requirements for the shipyards and oil and gas industries.

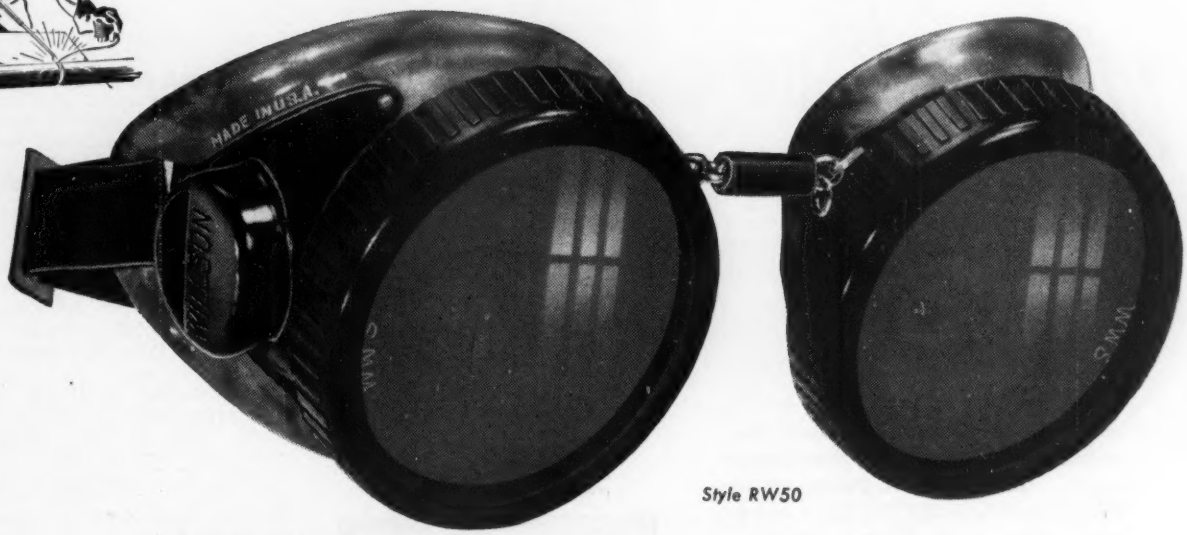
Philadelphia — Expanding requirements of the oil and shipbuilding industries are confronting plate mills with extra problems. In oil, plate demands are so heavy that allocations on an industry-wide basis appear near at hand. Ship work also may come in for top preference. While limited up to now, ship requirements are more active with a steady broadening likely as time goes on. In addition to some new tanker and passenger-cargo construction, either placed or pending, one special feature of present ship demand is a sharp increase in repair work, this including Navy as well as merchant ships.

Birmingham—Plate users, sensing what eventually would come from the coal strike, have clamored long and loud recently for deliveries that could not be forthcoming. New car busi-

In the Glare of the Torch—think of WILLSON

Style CW60

ROOM WANTED FOR SPECTACLES? . . . There's comfort for wearers of prescription glasses in Willson Cover-Alls.* And the adjustable leather bridge rests lightly on the nose without pressure. Willson-Weld* lenses in the shade you specify, of course.



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GAS WELDERS GO FOR IT . . . Assured protection of Willson-Weld lenses and comfortable face fit make this goggle day-in, day-out favorite for flame cutting and cleaning as well as welding. Indirect ventilating ports exclude glare.

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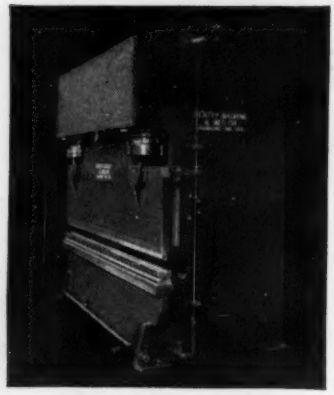
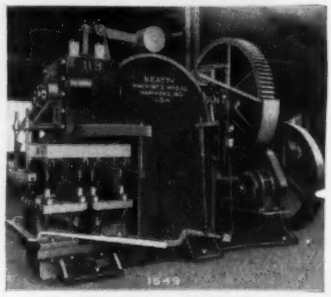
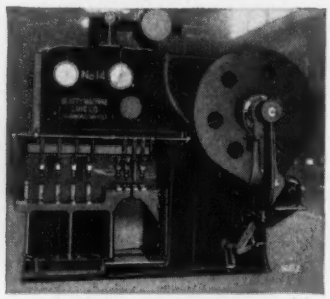
You can *win* or *lose* your battle of *sales* on *price!* *Obsolete* machinery means *high* production costs. But modern, *tailor-made* BEATTY-ENGINEERED machines can give you faster, higher-quality production at a *lower* cost. And you'll need that cost advantage in tomorrow's market. There's a better way to handle most production jobs. *Our* job is to help you find that *better* way. Call us in *now.* Our broad experience in metal working production qualifies us to handle the most difficult assignment.



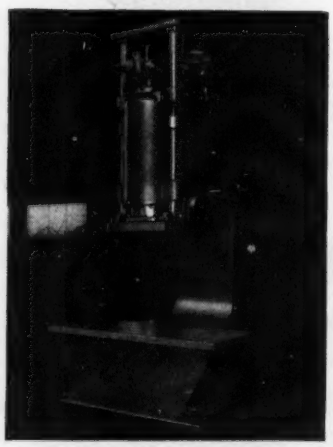
BEATTY Hydraulic Press Brake for V-bending, forming, pressing, flanging.



BEATTY Single End Punch available in capacities up to 350 tons. Ideal for car shops and jobs requiring multiple tooling.



BEATTY No. 14 Toggle Beam Punch for structural steel fabrication.



BEATTY 250-ton Gap Type Press for forming bending, flanging, pressing.

HYDRAULIC HEAVY METAL WORKING EQUIPMENT

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ness at Bessemer is being given preferential treatment and other plate users remain on the waiting list. The 140-inch mill at Fairfield closed Apr. 9 due to the coal strike.

Seattle — Plate supplies are increasingly short and fabricators are forced to make substitutions in many instances. While no large projects are up for bids, management is increasingly careful in making tenders which are based on stocks available. Mills are deferring shipments.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 130

Seattle — Rolling mill capacity is heavily taxed by the volume of small orders for reinforcing bars; demand for merchant bars is also above normal. Backlogs remain static as new business offsets production and mills are sorely pressed to make prompt deliveries. Several major projects, involving bars, are pending, including 7150 tons for the Hungry Horse dam.

Structural Shapes . . .

Structural Shape Prices, Page 131

Boston — Bulk of inquiry for fabricated structural steel covers public and institutional construction, schools, housing and churches; demand for private building is off materially. Including bridges, several thousand tons are active with delivery wanted this summer or fall. Most housing projects are to be reinforced concrete with some fair tonnages of fabricated structural steel involved. Losses in plain material production have prevented any inroads on backlogs with prospects for third quarter clouded by uncertain, but substantial backlogs. Shipbuilding requirements will be heavier late this year and early next year.

Outstanding contracts for structurals placed in the Boston district include 1300 tons, Charles Hayden memorial library, Massachusetts Institute of Technology, Cambridge, and 2600 tons, department store, Boston; both will be fabricated by the same Pennsylvania shop.

New York — While considerable building work is under contemplation, structural orders are scattered. The largest to have been reported here involves approximately 1200 tons for an elevator trestle for the New York City Board of Transportation.

Shape deliveries will probably be retarded for some time as a result of the recent coal strike. Some producers estimate it will require as much as six weeks for output to get back to normal; others estimate three to four weeks.

Philadelphia — Most structural shape mills are expected to get back to normal operation by the end of this month. Meanwhile, fabricating shops are maintaining operations at a good rate, as their inventories have been sufficient to enable them to absorb much of the shock of the recent dip in mill shipments. Structural backlogs average five to six months, with most fabricators proceeding on a selective basis in estimating new work.

Seattle — Fabricators report a steady volume of new business in small tonnages of less than 100 tons

each, many of them for schools, also small industrial projects. The supply situation is serious and will be aggravated as the interrupted production of eastern mills is reflected here. Shipments are being deferred, depleting inventories and causing fabricators to hesitate in bidding on large jobs.

Tin Plate . . .

Tin Plate Prices, Page 131

Pittsburgh — Tin plate producers have entered second quarter with relatively little carryover tonnage and it appears probable producers will not lose significant tonnage resulting from the coal strike. Producers are channeling as much steel as possible into the production of sheets and tin plate, as indicated by the fact that production schedules of other finished steel items have been sharply reduced. However, stocks of slabs and coils have been substantially reduced during the period of curtailed steelmaking operations in recent weeks. No openings in production schedules have been noted recently. It is pointed out seasonal pressure for food packing containers is gaining momentum and any set-back in production at this time would have serious repercussions. No definite tonnage for export under ERP has yet been made public, although overall current export quotas are expected to be within the scope of ERP requirements. Third quarter export quotas have not yet been announced and are not expected to exceed the 112,000 tons scheduled to be shipped this period.

Chicago—Inland Steel Co. suspended operation of its tin mill department again last week when shearmen failed to return to their posts. Several of the shearmen have been discharged. The department had been idle two weeks following walkout of the shearmen in a dispute. After the two-week shutdown, the company had sought to restore operation of the electrolytic coating lines.

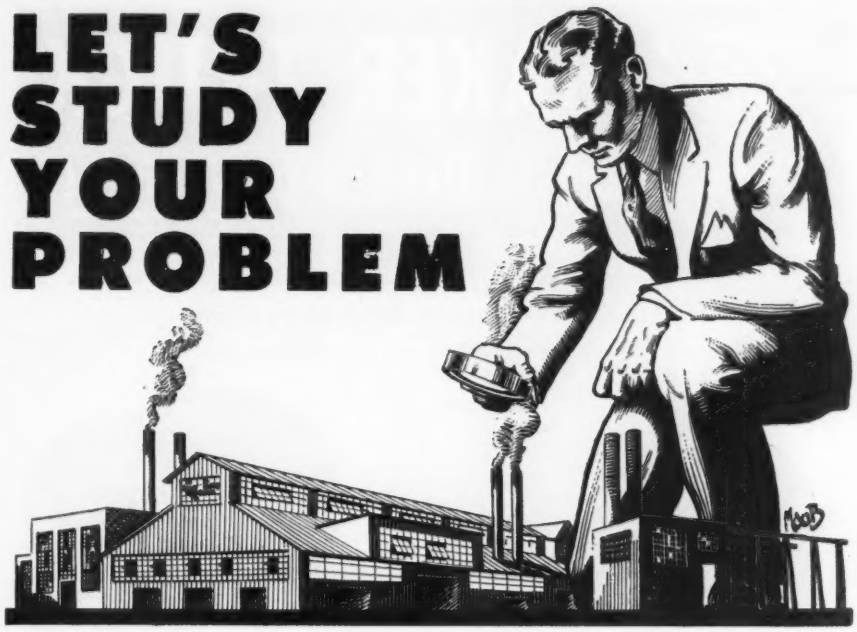
Tubular Goods . . .

Tubular Goods Prices, Page 131

Boston—Bessemer butt weld pipe, 3½ inch and under, has been set back by reduced semifinished steel production. Demand for merchant steel pipe, notably seamless, is strong and distributor inventories are low and turning over steadily to the extent of allocations. Some third quarter volume in electric welded pipe is being booked, but indications are quotas of steel pipe for that period will be at current levels or slightly lower. Demand from utilities is in excess of quotas, not only from utilities in this area but for oil and gas distribution lines in other states to be bought in Boston. Required tonnage for housing and other construction is difficult to obtain, pipe frequently coming from several distributors and mills. Pressure tubing demand is slightly higher.

Seattle — Cast iron pipe demand is slow as buyers are deterred by 24-month deliveries which may be extended as the production interruption at Eastern and Gulf mills reaches the West Coast. The potential demand in this area is extensive but in many instances other types of material have been purchased.

LET'S STUDY YOUR PROBLEM



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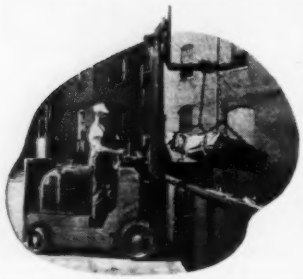
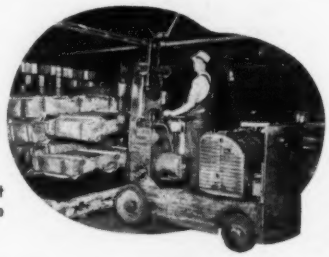
PRODUCTS: Coca-Cola cooler-dispenser, Quaker Oil space heater.

TRUCKS: 6 Baker Fork Trucks—4 2000-lb. and 2 6000-lb. capacity.

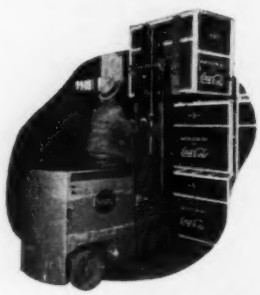


Baker 6000-lb. Fork Truck unloading skidded 6-ton packages of sheet steel from gondola cars with chain sling.

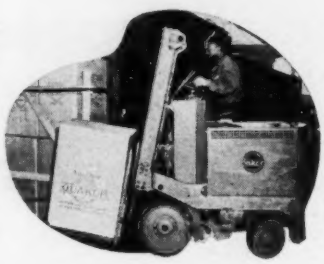


Some truck tiering sheet steel packages in storage department.

OPERATION	TRUCKS USED	RESULTS
Unloading steel sheets in 3-ton skidded packages from gondola cars (50 tons per car). Transporting to storage and tiering.	Baker 6000-lb. Fork Trucks	48 man hours cut to 4. Formerly took 6 men 8 hours for unloading alone. Now 2 men safely unload *and store* a carload in 2 hours.
Handling steel sheets from stores into production line.	Baker 6000-lb. Fork Trucks	More man hours saved. Aisles kept clear.
Handling and storing dies for stamping and blanking departments.	Baker 6000-lb. Fork Trucks	Time and storage space saved.
Moving finished products in cases to storage.	Baker 2000-lb. Fork Trucks	Operation speeded 50%. Warehouse capacity increased 50%.
Moving finished products from storage into boxcars.	Baker 2000-lb. Fork Trucks	16 man hours cut to 1. Formerly took 4 men 4 hours to load a car. Now 1 man does it in about 1 hour.



Baker 2000-lb. Fork Truck tiering cases of finished product in warehouse.



Baker 2000-lb. Fork Truck loading cases into boxcars.

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Baker INDUSTRIAL TRUCKS

Bid Abstracts Submitted In FTC's Steel Case

Washington—Presentation of Federal Trade Commission's evidence of alleged price collusion in the steel industry may be completed "within thirty days" as a result of a decision by Trial Examiner Frank Hier, Attorney Lynn C. Paulson asserted last week.

The trial examiner had overruled steel attorneys' objection to acceptance as exhibits abstracts of steel bids to the Navy and Tennessee Valley Authority in 1940. Their contention in particular was that the abstracts showed only unit base prices quoted by the steel companies and did not reveal qualifying terms, such as waived extras or delivery charges. Instances were cited by the attorneys where a steel contract was let by the Navy for $120,000 under the next bid, whereas the Navy's abstract showed all companies quoting identical prices. A sale to TVA was made at market price but allowed free delivery on dock, which steel attorneys said was tantamount to a cut of $1.80 a ton under market price.

Steel attorneys also objected to Mr. Paulson's presentation of abstracts of bids received in 1940 on the ground that the date is too remote to be indicative of conditions of competition prevailing in 1947 when the complaint was made. Examiner Hier explained that the respondents can point out any errors or omissions in abstracts later and that individual consideration of the 2000-odd steel bids involved would stretch the hearing out unduly and would not develop anything which the respondents cannot bring out in their defense.

Wire . . .

Wire Prices, Page 131

New York — Except for slower buying by the bedding industry, with a scattering of cancellations, demand for wire is unabated; most consumers are taking up their quotas in full and some are seeking more tonnage. Producers of steel wool are beginning to cut into baclogs, but the only major wire product in balance with demand at normal delivery is rope. Second quarter allocations will be held down by carryovers, quotas for the period being approximately 10 per cent lower with one producer. Rod volume is limited with most integrated producers drawing more wire and shipping less rod tonnage. Consumers are also frequently confused by prices; while the Worcester, Mass., base applies to considerable volume, some producers are selling on a Pittsburgh base.

Boston — Screw manufacturers with equipment for drawing wire are handicapped by lack of rods and in buying finished wire by shortages in the middle range of sizes. Screw backlogs are substantial and the recent slackening in new orders in some directions is due in part to reluctance of producers to increase backlogs in view of the current steel supply outlook. Heading wire demand with other producers of fasteners is in excess of supply, lack of balance in sizes being general. Only in spots is there

any easing in demand and allocations are taken in most cases. There is some let-down in pressure from the automobile trade, indicating wire inventories are better balanced in ratio to other steel products.

Birmingham — While wire production did not suffer too much as a result of the coal strike, production remains far below requirements. Threat of a complete shutdown resulted in new pressure for wire products. Result is that jobbers and wire processors have nothing to offer.

Wheeling Steel Contracts For Large Oxygen Plant

New York — Wheeling Steel Corp. and the Linde Air Products Co., a unit of Union Carbide & Carbon Corp., have completed arrangements for Linde to install a large, low-purity oxygen plant at Wheeling's Steubenville, O., steel mill. Linde's plant will produce approximately 135 tons of oxygen a day to be used for metallurgical purposes, chiefly in the open hearth furnaces.

Pig Iron . . .

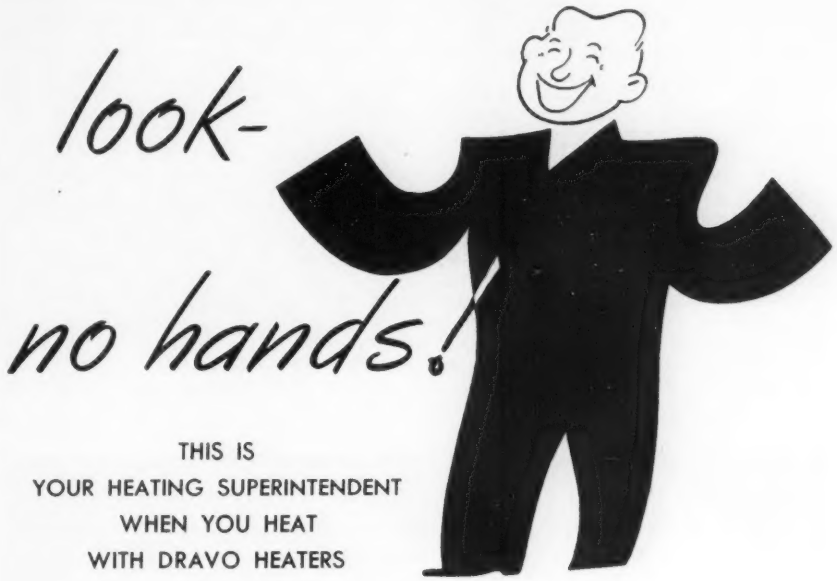
Pig Iron Prices, Page 132

Pittsburgh — Despite partial resumption of coal mining operations, further reduction in pig iron output occurred last week. Producers were unwilling to gamble on the possibility of early resumption of full scale mining operations. Toward the close of last week pig iron production loss represented the equivalent of about 15 blast furnaces, due to the shortage of coal. A number of additional foundries here were forced to shut down, while many others continued to curtail production schedules. One large integrated steel mill has taken out of service those blast furnaces formerly on merchant iron, while output of lone merchant producer is substantially curtailed.

The DPC Monessen, Pa., blast furnace, recently purchased by Pittsburgh Steel Co., is expected to be ready for operation early next month. Output of this furnace will reduce the company's scrap requirements by about 60 per cent.

New York — Pig iron producers estimate it will require at least 10 days to two weeks, if not longer, to get production back to normal at most furnaces, once coal starts freely moving again. Exceptions will be where it has been decided to do a relining job on the furnace, in which event it will require 45 to 60 days from time of suspension. In most instances the principal delay will be in getting the coal moving again. Some coke producers say it will require almost 10 days alone for the movement of coal after the general resumption of mining, to say nothing in certain instances of moving the coke from the ovens to the furnaces.

Boston—Supply of basic is precarious with all consumers operating on a close margin without inventory. No improvement is in sight. Foundry operations are adjusted to the Everett furnace output for the most part, although there has been some decline in melt by jobbing shops and stove



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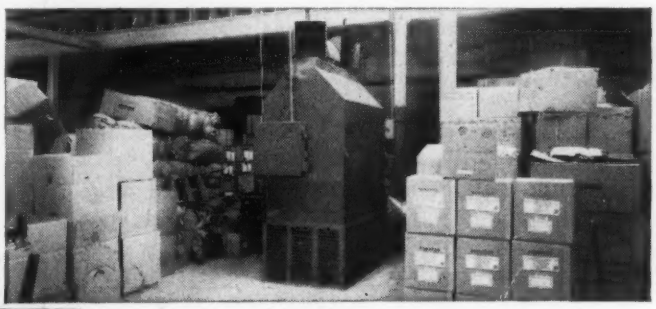
Dravo *Counterflo* Heaters are available in sizes ranging from 400,000 to 2,000,000 BTU output. Equally efficient with oil or gas and with or without ductwork, they can be floor-installed, wall-hung or roof-hung. Write for Bulletin HU-516. Heating Section, Dravo Corporation, Dravo Building, Pittsburgh 22, Pennsylvania.



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According to Mr. Schulman, President of Sanatex Company, the Dravo *Counterflo* Heater "is the best equipment we ever had. Delivery of heat is virtually instantaneous when the unit goes into action—an important fuel-saving feature which eliminates the need for anticipating cold spells or keeping the heater in operation when the plant is closed."

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producers. The high ratio of scrap in melts continues a costly factor in the output of castings and rejections are high in many cases. Eastern Gas & Fuel Associates has entered into a contract with Brazilian interests for shipment of coking coal to that country and returning ships will carry iron ore.

Philadelphia — Foundries will probably see a more rapid recovery in pig iron supply than in oven coke, now that the miners are returning to work. There should be a fair improvement in pig iron shipments within the next week or 10 days; the acceleration in the movement of oven foundry coke will be less pronounced. One leading district coke producer will not even start to produce foundry coke until May and in this instance, due to a long range program of oven repairs, which started last spring and then was suspended during the winter and subsequently resumed, shipments will continue restricted throughout the greater part of the year.

Reflecting stringency in iron, two carlots of iron have just been delivered in this district from Daingerfield, Tex. The price was $75, base, plus about $15 freight.

Buffalo—While the termination of the coal strike checked the recession in pig iron output, it is not likely that a return to normal operations will take place before the end of the week. Bethlehem Steel Co.'s Lackawanna mill blew-in one of its three idle stacks and increased the wind on its three active stacks. Coal and coke stocks, however, are low in most producers' yards. The temporary curtailment in iron output will only serve to further aggravate the supply pinch for foundries in this area. With 12 of the 16 stacks in action, operations stood at 75 per cent of capacity last week.

Chicago—Foundries are now feeling the pinch of interrupted shipments of pig iron and coke due to the coal strike and will continue to be affected for several weeks. Of the district's 41 blast furnaces 33 are operating currently as compared with 37 in the previous week and several batteries of coke ovens are idle. Estimates are that merchant iron supply is down as much as 40 per cent in some instances and coke shipments are off up to 30 per cent. Resumption of supplies will depend upon speed with which coal shipments will permit curtailed facilities to be restored. Meanwhile, foundries are forced to gear their melting schedules to receipts of iron and coke.

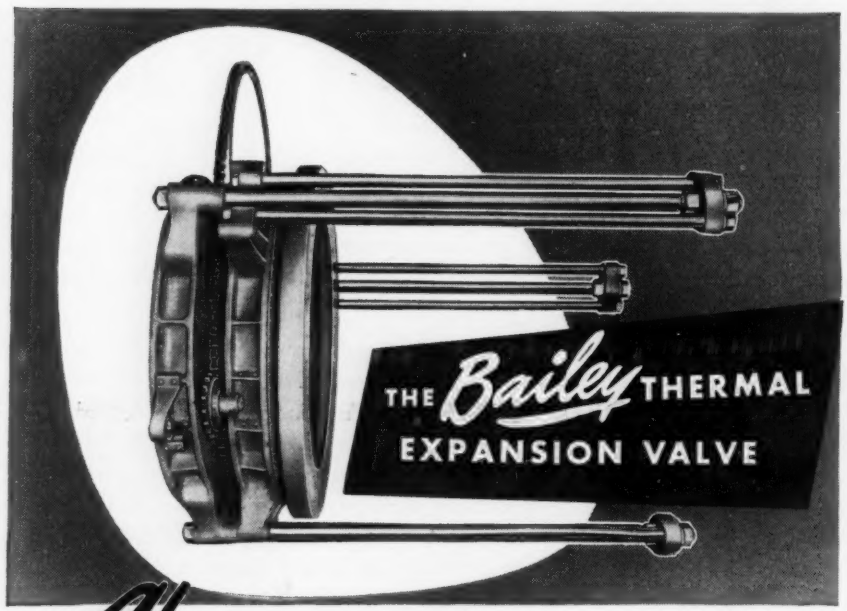
Cincinnati—Full weight of the effects from the coal miners' walkout hit pig iron shipments in this district. The shipments of northern and southern iron, excepting for a trickle, had ceased last week. Foundry operations slid downward further. Some foundries, unable to get either coke or iron, were forced to shut down.

Birmingham — Pinch in pig iron has gotten progressively worse since the coal strike. Tennessee Coal, Iron & Railroad Co. and Republic Steel Corp. have only two blast furnaces each in operation here. Of the merchant iron producers, Sloss-Sheffield Steel & Iron Co. is the only one still at capacity. Woodward Iron Co. has but one stack in operation. Iron users, already suffering, are virtually stymied as indicated by lay-offs at several larger industries here.

St. Louis — Pig iron production here continues 20 per cent and coke output 30 per cent below capacity because of unsuitable coal. Coal strike has cut off usual sources of good coking coal for local production and coke shipments from the outside have not fully met needs. Operations were expected to return to capacity, however, within a week after settlement of the mine shutdown. Iron consumers have absorbed the shortage prorata and in general have not suffered seriously. Shortage in this district will be worst after July 1. Repairs on one of Missouri-Illinois Corp.'s two blast furnaces, formerly expected to require less than a month, now are predicted to cut output in half for two and one-half months.

Koppers Awarded Contract To Build 51 Coke Ovens

Chicago — Peoples Gas Light & Coke Co. has awarded a contract to Koppers Co. Inc., Pittsburgh, for erection of 51 by-product underjet coke ovens, costing more than $3,500,000. The new ovens will increase the carbonizing capacity of the company's Crawford Ave. plant by about 40 per cent. The ovens are unique in that they will be constructed so that natural, producer, propane, butane or coke oven gas can be used to heat them.



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WILLIAM M. Bailey COMPANY
ENGINEERS
LEADERSHIP THROUGH QUALITY
PITTSBURGH PENNSYLVANIA

Scrap . . .

Formula prices hold steady with consumers replenishing inventories

Scrap Prices, Page 136

New York—Scrap brokers' buying prices continue unchanged on all major grades. Steel scrap is coming out freely, with both Pittsburgh and eastern Pennsylvania consumers taking all offered at formula levels. Cast scrap prices are unchanged but some sellers look for increasing strength, once foundries are in position to obtain a better supply of coke and thus step up their melt.

Boston—More steel scrap is coming out but consumers complain of the quality. Prices are firm and there are cases where better than the formula level is being paid for heavy melting steel by dealers. Buying of cast has slackened with several of the larger melters withdrawing from the market. Brokers offer up to $55 for cupola cast for outside shipment. Chemical borings went up sharply for a time to $39, shipping point, on competitive bidding by brokers.

Philadelphia — Steel scrap prices are steady, and, except for continued premiums for No. 1 steel of prime quality, are at formula levels. The flow is good and, despite restricted consumption occasioned recently by the mine strike, the mills have been taking in all the tonnage offered. However, there has been some complaint recently by the mills over the quality of material received, and this may lead to rejections. Cast grades also are unchanged.

Bethlehem's ship-breaking yard in Baltimore last month shipped 26,000 tons, a new high. Of this amount, 16,000 tons represented scrap prepared at the yard and 10,000 tons brought in from overseas and in need of no special preparation.

Buffalo — Steady strength dominates the scrap market as dealers report fresh buying interest at prevailing prices for steelmaking grades. Ingot operations have rebounded following the coal tieup and heavier inroads on scrap stockpiles are expected as mills gradually step up blast furnace operations. No new sales of any consequence were reported during the week as dealers continue to ship against old contracts. However, new contracts are reported in the offing at the same formula price as soon as present orders are completed.

Easier tendencies have now been noted in the cast market here. Prices dropped up to $5 on No. 1 cupola to a range of $62.50 to $63.50. Scattered sales took place within the range. Mixed cupola was quoted at $58 to $60. After considerable confusion, turnings were reported changing hands on the formula basis.

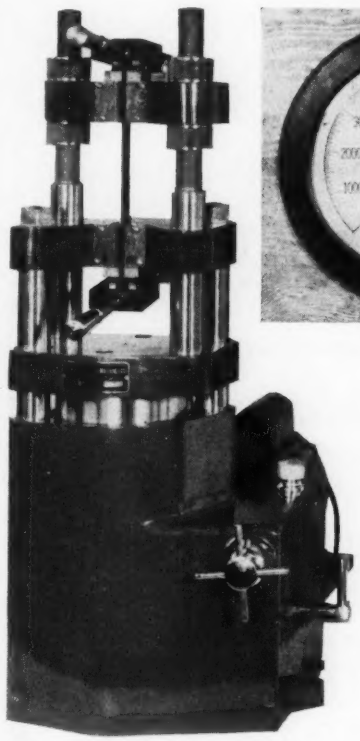
While the weather has improved, the recent flow of scrap has been only fair.

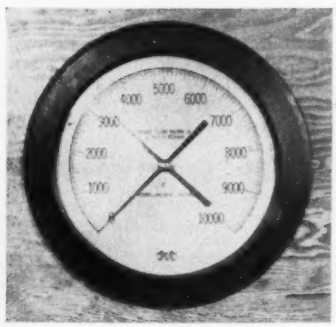
Cleveland — A slightly stronger price tone developed in the scrap market here last week, but prices were unchanged at the formula levels. No price change is anticipated in the immediate future. The market will receive its next big test early in May when new contracts will be made for large tonnages. Material is moving in good volume.

Pittsburgh — Some steel producers have attempted without success to buy open-hearth scrap recently at slightly below formula levels. First indication of weakness in quotations, if any develops, probably would be reflected in lower springboards. While bulk of remote scrap is shipped here within the $2.50 springboard, some open-hearth tonnage is still delivered at above $43. Mills are following a wait-and-see buying policy. The relatively little new ordering is restricted to small lot tonnages. While most mills have been able to augment their scrap inventories during the recent period of curtailed steel production, indicated capacity ingot output in the face of limited scrap supply for the long term point of view is expected to be the major factor sustaining present price levels. Seasonal influences should make possible more intensive scrap collection efforts, but indicated adverse effect on metalworking operations traceable to the sharp decline in output of some finished steel items during the past few weeks will be an offsetting factor.

One mill here has been forced to hold-up shipments of scrap and other raw materials due to complete cessation of its steel ingot and pig iron operations resulting from depleted coal stocks. However, the flow of scrap to consumers' yards has been fairly well sustained, even during the period of 50 per cent cutback in

Tensile Testing Machine





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Additional load gauges and various types of grips are available to suit requirements. This machine is readily adaptable to almost all special purposes within its capacity at slight extra cost.

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Detroit — Scrap market is holding firm at the formula price. Expectations of increased prices are heard in some quarters, on the basis of accelerated armament production, even though such projects may be as far as a year away. Only tangible evidence is the policy of some alloy steel mills to lay down a little more alloy scrap. Ford continues to buy actively inasmuch as a model changeover has meant the loss of virtually all production scrap for a period of a couple of months. Foundry scrap is a little easier since some castings production has had to be slowed or suspended because of coke shortages resulting from the coal strike. However, No. 1 cupola cast is still quoted at $60 to $62 per ton.

Chicago — Scrap market is holding steady, both in volume and pricewise. Steelmaking in this district was cut only 7-1/2 points by coal strike. Consequently scrap consumption did not drop markedly. Mills are accepting at prices which have been in effect during the past several weeks all scrap offerings and there is no indication now that that buying practice will be altered. Receipts exceed melting requirements by a small margin. Foundry demand has softened somewhat because operations are curtailed by pig iron and coke shortages.

Cincinnati — Demand for scrap is active, and the tendency toward softer prices on foundry grades has disappeared. Some foundries had withdrawn because they lacked coke and pig iron, some of this tonnage being absorbed by others who welcomed the chance to build scrap stocks. Tonnage has been moving steadily.

Birmingham — Scrap moves at a steady pace and at nominal and unchanged prices. Relatively small stocks are being accumulated and preparation has been helped by better weather conditions.

St. Louis — Mills and foundries continue to build ground stocks of scrap. Shipments maintain the gradual improvement they have shown in recent weeks, but have not reached a volume sufficient to depress prices. Quotations of heavy melting steel and leading foundry grades have been about unchanged three weeks. Mill reserves are approaching the 45-day level; foundry stocks, 30 days.

Seattle — Steel scrap is coming to tidewater in increasing tonnages and mills are able to accumulate small inventories which they hope to increase during the summer. Larger shipments are being forwarded from the interior, due to better weather and to the fact that coast ship-breaking plants are improving technique and enlarging production. Bethlehem Pacific Coast Steel Corp. is awaiting word on its high bid on 11 LST vessels, bids opened Mar. 30. Additional vessels of the same type are up for bids Apr. 13. Mill price is unchanged at $26 per gross ton.

Foundries report the cast iron scrap supply situation is somewhat easier, but the price is firm at $40. Since the Eastern coal strike, foreign buyers have been less insistent in this market which accounts for the better supply situation for local plants. However, outside interests are willing to outbid the local foundry top price.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 132

Pittsburgh — Acute scarcity of coke developing out of the coal strike has resulted in a few spot sales at well above quoted levels. Some foundries desperately in need of coke have attempted to use limited supply of beehive furnace coke, paying up to $16 in at least one instance. Some beehive ovens resumed operations last week at the expense of small coal stocks on hand, gambling on an early resumption of coal mining operations. However, overall beehive coke output has been relatively insignificant since partial resumption of coal mining, and there is little prospect of a substantial increase this week. By-product coke operations have been curtailed to under 70 per cent of capacity in most instances.

New York — Oven foundry coke has been advanced $1.75 to $20.50, Kearney, N. J., effective as of Apr. 13. Higher coal and transportation costs are mainly responsible for the increase.

Warehouse . . .

Warehouse Prices, Page 133

Pittsburgh — Disruption of mill rolling schedules on plates, shapes and bars due to the coal strike has resulted in further reduction in steel distributors' inventories of these items. Some warehouse interests anticipate mill allotments of sheets, strip and wire also will probably be cut-back in the coming months, although output in this district has been fairly well sustained to date. Steel distributors are unwilling to predict outcome of the Apr. 21 meeting with Secretary of Commerce Harriman on subject of establishing a steel allocation program from warehouse stocks to help meet essential requirements of "preferred" consumer groups. Most warehouse interests do not appear to be in favor of such a program, but are reserving definite conclusions until the distribution details have been fully explained.

Philadelphia — Shrinkage in mill receipts because of the coal strike has affected warehouse sales for the first time and, although miners are now returning to work, steel distributors believe it will be a few weeks before stocks can again be brought back to normal balance and that business in the meantime will suffer. They also are increasingly concerned about quotas for next quarter and possibly for that reason jobbers are leaning more favorably toward some form of voluntary allocation, such as will be discussed in Washington within a few days.

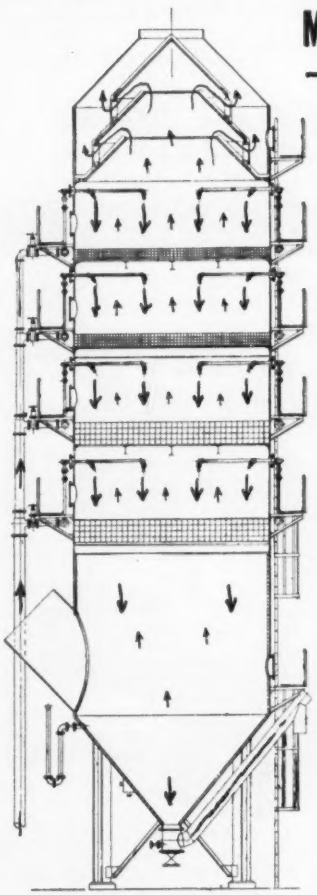
Cincinnati — Deliveries from some steel warehouses here were temporarily suspended last week due to Ohio river flood. Others were unable to absorb the diverted business, stocks being already light and unbalanced. Recent slowing of mill shipments has caused a wider gap between supply and a demand which apparently has not suffered from the coal shortage.

St. Louis — Warehouse steel stocks remain low with the prospect of a further drop next month when the coal strike deficit from the mills reaches the distributors in the form of reduced shipments. Consumer calls for warehouse steel are increasing due to better building weather. Incoming shipments are going out as fast as they arrive. Inventories are especially low, and the demand great, in sheets, plates, structural shapes, small shapes and light bars. Sizes are spotty in the tonnage which is on hand. In fair supply, however, are cold-finished bars, stainless steel, hot and cold-rolled alloy steel bars and large rounds in hot-rolled carbon steel.

United States Steel Supply Co. last week opened a new warehouse here which more than doubled the storage capacity of its former facilities and added the latest type cutting and shaping equipment. More than 3000 steel consumers attended an open house April 10. Local officials announced, however, it meant no increase in inventories at present. Shipments were held up, in fact, so as to have an inventory on hand one day which would be visible to the visitors.

Seattle — Jobbing houses report a steady volume of business. There is an accelerated demand for plates stimulated by ship repair work and public projects. Plates from 3/16 to 1-1/2 are extremely short and the situation will become more acute as the effects of the eastern coal strike reach the Coast. Reinforcing bars are scarce and it is often necessary

SEAVER *Improved* GAS WASHER *and* MOISTURE ELIMINATOR



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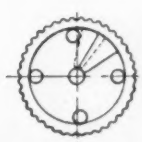
★ Prevents plugging

★ Wets both lower and upper surfaces of Spiral Tile

★ Washes thoroughly

The new and improved Seaver ceramic tile for gas washers has five holes; one through the center and four just inside the shell through the spiral. These enable part of the water to pass through and thoroughly wet the under side of the spiral and inside of the tile where the gas first impinges. The result is a greatly increased wetted surface for the gas to scrub against, giving thorough and complete washing of gas.



Top view of Spiral Tile shows holes which permit water to thoroughly wet the under side. Cross-section view of tile shows improved water distribution.

The Seaver moisture eliminator at the top consists of glazed elements and presents a large expanding area which reduces the velocity and requires the gas to turn 180° to reach its exit. This eliminates a large percentage of the moisture which contains dirt. This moisture is then deposited through holes on the lower tile banks to again do useful work.

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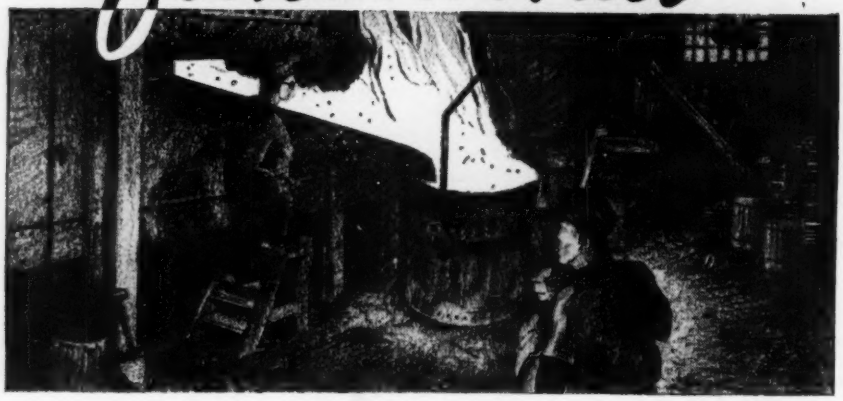

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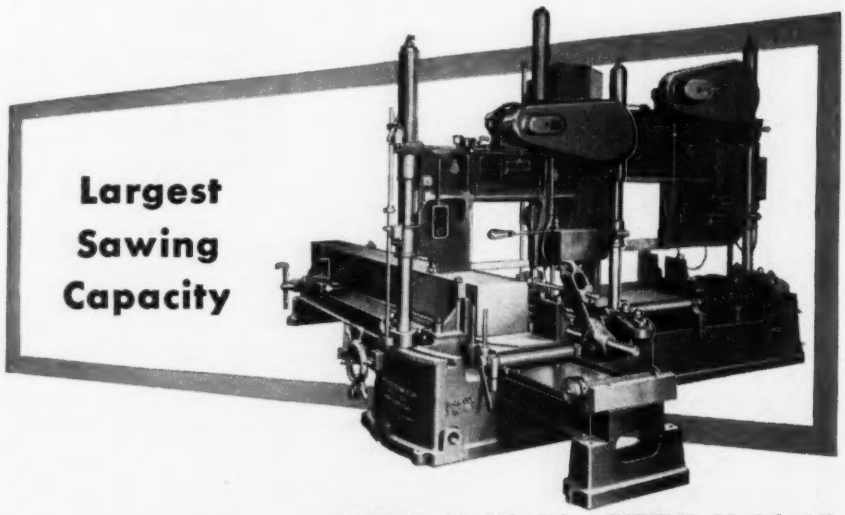

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Better Machines—Better Blades

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to substitute larger sizes. Supplies of alloys and tool steel are fair but mill allocations are tight, deliveries being deferred from the customary two months to four months. Sheets continue critical; pipe and nails are also tight, but cold finished steel and bars are in better supply. Prices are unchanged.

Rails, Cars . . .

Track Material Prices, Page 131

Seattle — Alaska Railroad has awarded Bethlehem Pacific Coast Steel Corp., Seattle, 9000 tons of tie plates and 1150 tons spikes. The railroad also has awarded 100 tons of frogs and switches to Ramapo Ajax Division, American Brake Shoe Co., Seattle. Contract for unstated tonnage of bolts is pending. The Bethlehem Seattle plant is also rolling 6000 tons tie plates for the Great Northern Railway and 3000 tons of tie plates for the Northern Pacific Railway.

Canada . . .

Toronto, Ont.—Comparatively little change has developed in Canadian iron and steel markets recently. Demand continues well ahead of supply in most lines, while prices remain unchanged at government ceiling levels. Steel mills are maintaining output at virtual capacity, limited only by their raw material supply which is somewhat below full requirements for various rolling mills. Steel ingot production is running at slightly better than 85 per cent of rated capacity, but when obsolete furnaces are taken into consideration it may be assumed that steelmakers are operating at virtual capacity.

Due to the fact that on practically all lines of carbon steels producers are booked solid through second quarter, there has been some lag in new order placing recently. There has been no slackening in demand, since consumers could use about 50 per cent more steel than is available. Imports from the United States have not been cut to the extent that was expected as a result of Canadian ban on imports to save U. S. dollars. Steelmakers continue to hand out supplies on a quota basis.

Steel sheets and plate continue to feature the list of short materials, and on these items mills are fully booked to the end of June and are not interested in additional bookings. Carbon bars also are in big demand with books filled. Producers are looking for more business in stainless, alloy and cold drawn steel. Structural steel shapes are tight, but the situation has not become as serious as was expected at the beginning of the year. Fabricators report replacements slow with demand well ahead of supply. Wire and nails are still difficult to obtain but production has been stepped up.

Merchant pig iron sales are being maintained at a high level with deliveries running about 8000 tons weekly. Melters cannot obtain enough iron to meet requirements. Blast furnace output is about 70 per cent of capacity. Canadian pig iron prices are as follows: Base grade, 2.25 silicon and under, $39.50; malleable, $40; basic, $39.50 delivered gross ton Toronto.

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hot-dip GALVANIZING

Scrap shortage is causing much concern to steelmakers and foundry operators. Only minor improvement in offerings have been reported with improved weather conditions.

Production of Canadian Aluminum at Record High

Canadian aluminum industry produced 606,420,000 pounds of aluminum ingot in 1947 for a record peacetime output which is almost five times the 128 million pounds turned out in 1938, last of the prewar years.

In addition to being the world's largest exporter of aluminum ingot and the second largest producing nation among the many countries in the industry, Canada today has more than 1000 processing and fabricating plants working with the light metal. A total of about 65,000 persons are employed in these plants and by the aluminum producing industry in the Dominion. U. S. aluminum output last year was 1142 million pounds.

Important factors in the growth of this industry in Canada have been the Shipshaw power development on the Saguenay river and increasing foreign and domestic demand. The power shortage in the U. S. has caused a marked increase in the American demand for the Canadian output.

Preparedness Program Seen Spuring Shipbuilding

(*Continued from Page* 47)

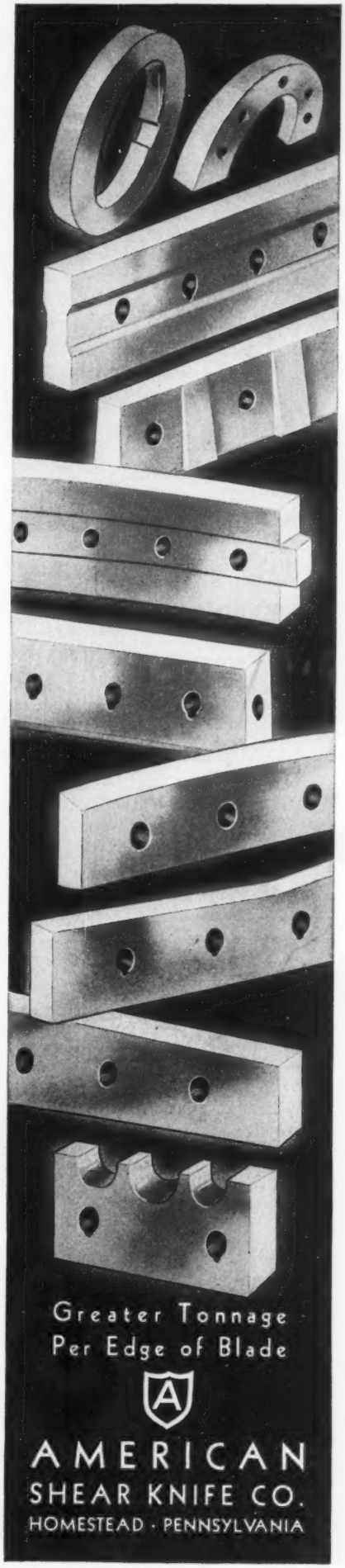
would be merely the first step in a general program which would run to many billions of dollars over a period of years.

Mr. Sullivan's general program calls for the following construction by 1951:

Fifty new passenger vessels capable of quick conversion to troopships carrying from 2000 to 10,000 men. A 48,000 gross ton liner to be built for the United States Lines, capable of carrying 12,000 troops upon conversion, is estimated to require 24,000 tons of plates, shapes and bars (STEEL, Apr. 12, p. 148). On this basis, a ship capable of carrying 6000 troops upon conversion would require approximately 12,000 tons of steel.

One hundred-seventy tankers of the T-2 class which is a ship of approximately 16,500 deadweight tons. Each of these ships requires about 4800 tons of steel.

Cargo Fleet Not Discussed—The navy secretary only hinted at plans for the rejuvenation of the nation's cargo fleet. He pointed out that the greatest part of the tonnage in this type is comprised of slow Liberty ships, while our few high quality



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McDanel thoroughness starts with the mixing of the batch and continues through every stage of production. Density, bore size, wall thickness, etc. must be 100% right. Add to this exactness of production routine, low coefficient of expansion and maximum resistance to thermal shock and you have the answer to why McDanel Tubes are so generally preferred by leading metal lurgical laboratories throughout the country.

Made with straight, tapered and double reduced self-cooling ends.

OTHER McDANEL PRODUCTS

- Self-cooling Combustion Tubes.
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- Refractory Porcelain Specialties in stock or designed to meet specific needs.

Specify McDanel High Temperature Combustion Tubes from your supplier.

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As WE make it . . .

—so shall *you* sleep—to awaken *refreshed* for a busy day in industrial Detroit. Those coveted innersprings (out for the duration) are still with us!

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800 OUTSIDE ROOMS ALL WITH PRIVATE BATH . . . SINGLE FROM $3.00 . . . DOUBLE FROM $4.50

Charles H. Lott, General Manager

cargo ships, although excellent for their purpose, were all constructed between 1939 and 1946 and will become obsolescent in a block.

"Unless tanker and combination-passenger shipbuilding is supplemented at some future date by a program for construction of high speed, high quality cargo vessels to replace the war-built tonnage," Mr. Sullivan added, "we will not have the balanced merchant fleet which national security demands."

He said there were two major defects in the present situation of the merchant fleet and the shipbuilding industry. One was the lack of fast tankers and passenger ships, and the other was the grave shortage of technicians and ship architects and planners.

Personnel Shortage Alarming—At present, he said, only about 35,000 workers are engaged on new ship construction in all types of U. S. shipyards. This compares with 110,000 employed in 1940 and 1,300,000 in August, 1943. Mr. Sullivan declared that the industry needs between 80,000 and 100,000 workers if the demands of a future emergency with respect to ships can be met.

Steel Output Sets New Peacetime High Records

Steel ingot production increased to 22,025,610 tons in the first quarter to a new peacetime high for the period, the American Iron & Steel Institute reported last week. This output was 1,082,816 tons larger than that for the like 1947 period, but was 133,836 tons smaller than production in the final quarter of last year.

Steel furnaces operated at an average rate of 94 per cent of capacity in the first three months of this year compared with 96.4 per cent of the smaller capacity in the fourth quarter and 93.1 per cent in the first quarter of last year.

Because of the coal miners' walkout, which started on Mar. 15, operations at the end of the quarter dropped to 88.3 per cent of capacity, as companies sought to stretch their fuel reserves.

Despite the effect of the stoppage in coal mining, production of ingots and steel for castings in March at 7,612,624 tons, was the highest for that month in peacetime and compared with 6,940,210 tons in February and 7,307,486 tons in March, 1947. Steel furnaces were operated at an average of 95.3 per cent of capacity last month compared with 93 per cent in February and 94.3 per cent in March of last year.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5500 tons, newsprint plant, Coosa River Newsprint Co., Childersburg, Ala., to Virginia Bridge Co., Roanoke, Va.; Daniel Construction Co., Birmingham, Ala., general contractor; project also takes 1000 tons of reinforcing bars, to be bought.

2700 tons, sheet piling, breakwater, Buffington plant, Universal Atlas Cement Co., Gary, Ind., to Carnegie-Illinois Steel Corp.

1700 tons, power plant addition, Connecticut Power & Light Co., Devon, Conn., to American Bridge Co., Pittsburgh, through United Engineers & Constructors Inc., Philadelphia, engineers-contractors.

1300 tons, Charles Hayden Memorial library, Massachusetts Institute of Technology, Cambridge, Mass., to Lehigh Structural Steel Co., Allentown, Pa.

1200 tons, elevator trestle, Board of Transportation, Bronx, New York, to American Bridge Co., Pittsburgh.

890 tons, dormitory, Watch Tower Bible & Tract Society, Columbia Heights, Brooklyn, N. Y., to Harris Structural Steel Co., N. Y.

600 tons, three laboratory buildings, Du Pont, Wilmington, Del., to Bethlehem Fabricators Inc., Bethlehem, Pa.

500 tons, Pennsylvania bridge, Baltimore, to Bethlehem Steel Co.

400 tons, additions, Gulf Refining Co., through Turner Construction Co., Philadelphia, to Bethlehem Steel Co.

370 tons, boiler house, state hospital, Norristown, Pa., through Wark & Co., Philadelphia, to Bethlehem Steel Co.

280 tons, bridge, proj. U-08-5(34), Douglas County, Wis., for state, to American Bridge Co., Pittsburgh.

275 tons, 2-story office building, North Ave. and Main St., New Rochelle, N. Y., to Grand Iron Works Inc., New York.

200 tons, Hanford, Wash., power plant, to Pacific Car & Foundry Co., Seattle.

190 tons, building, Logan airport, Boston, Mass., to Phoenix Bridge Co., Phoenixville, Pa.

150 tons, signal towers, Board of Transportation, Bronx, New York, to Schacht Steel Construction Inc., that city.

130 tons, substation, Board of Transportation, Bronx, New York, to Schacht Steel Construction Inc., that city.

120 tons, state bridge and railroad underpass, Ware, Mass., to American Bridge Co., Pittsburgh; San-Vel Contracting Co., Littleton, Mass., general contractor.

STRUCTURAL STEEL PENDING

3350 tons, Hungry Horse dam, Montana; general contract to General-Shea-Morrison, low, $43,431,000.

1650 tons, bridge approach, Memphis Highway, Memphis, Tenn., bids closed.

700 tons, addition, School No. 111, Queens, New York, general contractors bids to be opened Apr. 23.

600 tons, manufacturing building, Philadelphia; bids Apr. 27.

475 tons, phosphorus plant, Pocotello, Idaho; bids through United Engineers & Constructors, Philadelphia.

300 tons, state bridge, Middlesex county, New Jersey; bids Apr. 29.

Unstated, Yakima river bridge, Washington state; general contract to J. A. Terteling & Sons, Boise, Idaho.

Unstated, materials for Hungry Horse and Coulee power plants; bids to Bureau of Reclamation, Denver, Apr. 29.

Unstated, control building, Coulee dam; general contract to General Construction Co., Seattle, and Peter Kiewit & Sons, Omaha, Nebr.; joint low $2,789,294.

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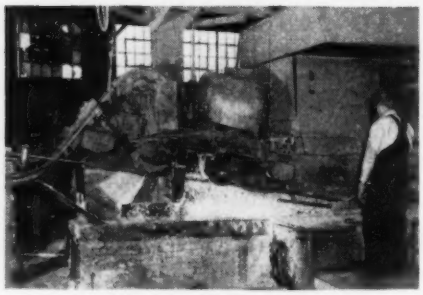

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Francisco. Previously reported erroneously as pipe award.

338 tons, pier extension, Port of Olympia, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; M. P. Butler, Seattle, general contractor, low $234,270.

REINFORCING BARS PENDING

7150 Hungry Horse dam, Montana; general contract to General-Shea-Morrison, joint low bidders, $43,431,000.

350 tons, highway and bridge extension, Hebron-Columbia, Conn.; bids Apr 19, state highway department, Hartford.

300 tons, Port of Tacoma cold storage plant; R. T. Earley, Tacoma, low, $706,989.

125 tons, steel sheet piling, inv. 136, U. S. Engineer, Memphis; bids Apr. 23.

100 tons or more, Washington state bridge, Lincoln county; Goodfellow Bros., Wenatchee, general contract award at $168,548.

PLATES . . .

PLATES PLACED

9000 tons, for Alaska Railroad, to Bethlehem Pacific Coast Steel Co., Seattle; also 1150 tons spikes.

6000 tons, for Great Northern Railway to Bethlehem Pacific Coast Steel Corp.

3000 tons, for Northern Pacific Railway to Bethlehem Pacific Coast Steel Corp.

380 tons, also 80 tons shapes, two boats for Central Barge Lines, Chicago, to Calumet Shipyard & Dry Dock Co., Chicago.

200 tons or more, barge and two small tugs, to Winslow Marine Railway, Winslow, Wash.

130 tons, 20 inch steel water pipe for Longview, Wash., to Hydraulic Supply Mfg. Co., Seattle.

100 tons, tanks for evaporating waste liquid at kraft plant, Weyerhaeuser Timber Co., Springfield, Oreg., to Hydraulic Supply Mfg. Co., Seattle.

100 tons, tanks for the Texas Co., to Puget Sound Bridge & Dredging Co., Seattle.

Unstated tonnage, steel water tank, veterans' hospital, Saginaw, Mich., to Pittsburgh-Des Moines Steel Co., Pittsburgh, $55,640.

PLATES PENDING

2700 tons, Hungry Horse dam, Montana; general contract to General-Shea-Morrison.

PIPE . . .

CAST IRON PIPE PLACED

125 tons, 6000 feet 6-inch for Longview, Wash., to H. G. Purcell, Seattle, for U. S. Pipe & Foundry Co., Burlington, N. J.

CAST IRON PIPE PENDING

200 tons, bids opened at Tamoca, Wash., Apr. 12.

RAILS, CARS . . .

RAILROAD CARS PLACED

Chicago & North Western, 1000 fifty-ton box cars and 650 seventy-ton hopper cars, to Pullman-Standard Car Mfg. Co.; 650 seventy-ton gondolas, to Bethlehem Steel Co.

Chicago, St. Paul, Minneapolis & Omaha, 150 seventy-ton hopper cars to Pullman-Standard Car Mfg. Co., Chicago, and 150 high-side gondolas to Bethlehem Steel Co.

Louisville & Nashville, 4000 fifty-ton hoppers to Pullman-Standard Car Mfg. Co.

RAILROAD CARS PENDING

Grand Trunk Western, 500 forty-foot six-inch box cars and 200 fifty-foot six-inch box cars; bids asked.

Grand Trunk Western, 700 fifty-ton steel-sheathed wood-lined box cars, bids asked.

LOCOMOTIVES PENDING

Chicago, Great Western, 8 locomotives, including two 6000-horsepower diesel freight, three 1500-horsepower diesel road, and 1100-horsepower switch engines; purchase authorized.

CONSTRUCTION AND ENTERPRISE

ARKANSAS

EL DORADO, ARK.—Lion Oil Co. plans to spend $500,000 to remodel a plant to manufacture nitrogen fertilizer.

GEORGIA

ATLANTA — Electric Storage Battery Co., 19th St. and Allegheny Ave., Philadelphia, plans to build a $150,000 storage battery plant here.

ATLANTA—Safway Steel Scaffolds Co. has received a low bid of $109,814 from Griffin Construction Co., 26 Third St. NW, for erection of an office and warehouse.

ILLINOIS

CHICAGO—Ludlow Typograph, 2032 Clybourn St., has awarded a $150,000 contract to Builders Co., 2 W. Harrison St., for construction of a factory addition.

SKOKIE, ILL.—Portland Cement Association, 33 W. Grand Ave., Chicago, will build a research and development laboratory here on a 15-acre site. Two buildings will have a total floor area of 98,000 sq ft.

STICKNEY, ILL.—Commonwealth Edison Co., Clark and Adams St., Chicago, has awarded a contract to John Griffith & Son Co., 228 N. La Salle St., Chicago, for construction of a generating plant. Total cost, including equipment, will be $35 million.

INDIANA

INDIANAPOLIS — Indiana Heel & Rim Co., 1032 N. Illinois St., has awarded a $100,000 contract to Glenroy Construction Co., 4921 Orion St., for erection of a factory service building.

KENTUCKY

LOUISVILLE, KY.—Monarch Equipment Inc., c/o contractor, has awarded a $200,000 contract to Whittenberg Construction Co., 2214 S. Floyd St., for erection of a warehouse and office.

LOUISIANA

NEW ORLEANS—National Cylinder Gas Co., c/o contractor, has awarded a $75,000 contract to Boh Bros. Construction Co., 2400 Cypress St., for erection of an acetylene gas plant.

MARYLAND

BALTIMORE — Consolidated Gas, Electric, Light & Power Co., Lexington Bldg., will build a $1 million generating station and a $320,000 electric utility plant.

ROSSVILLE, MD. — Baltimore Brick Co., George C. Warehime, secretary-treasurer, 3601 E. Monument St., has awarded a contract to Consolidated Engineering Co. Inc., 20 E. Franklin St., for a tunnel kiln building.

MASSACHUSETTS

ATTLEBORO, MASS.—Metals & Controls Corp., Forest St., has awarded a $175,000 contract to Rowley Construction Co., 260 Central Ave., Pawtucket, R. I., for erection of a factory.

MICHIGAN

BAY CITY, MICH.—Valley Steel Casting Co., 11th St., has been formed by Mendel A. Fair with a capital of $150,000 to manufacture and sell castings.

CADILLAC, MICH.—Cadillac Co. Inc., Seventh St., has been formed by Elmer J. Shustrom with a capital of $100,000 to manufacture and machine castings.

DETROIT—P-R Die & Stamping Co., 25 E. Atwater St., has been formed by Carl A. Rosenquist with a capital of $100,000 as a die and stamping business.

DETROIT—Arrow Metal Products Corp., 1200 Mt. Elliott, has been formed by Philip K. Nebus with a capital of $300,000 to manu-

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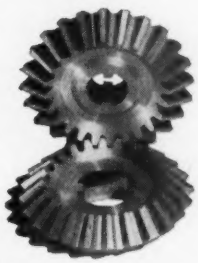

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HERRINGBONE GEARS—Made from 1" to 60" in diameter and from 10 DP to 1½ DP.
SPIRAL BEVEL GEARS—Made from 1" to 30" in diam. and 24 DP to 1½ DP.
WORM GEARS—Made from 1" to 100" in diam. and from 24 DP to 1 DP.

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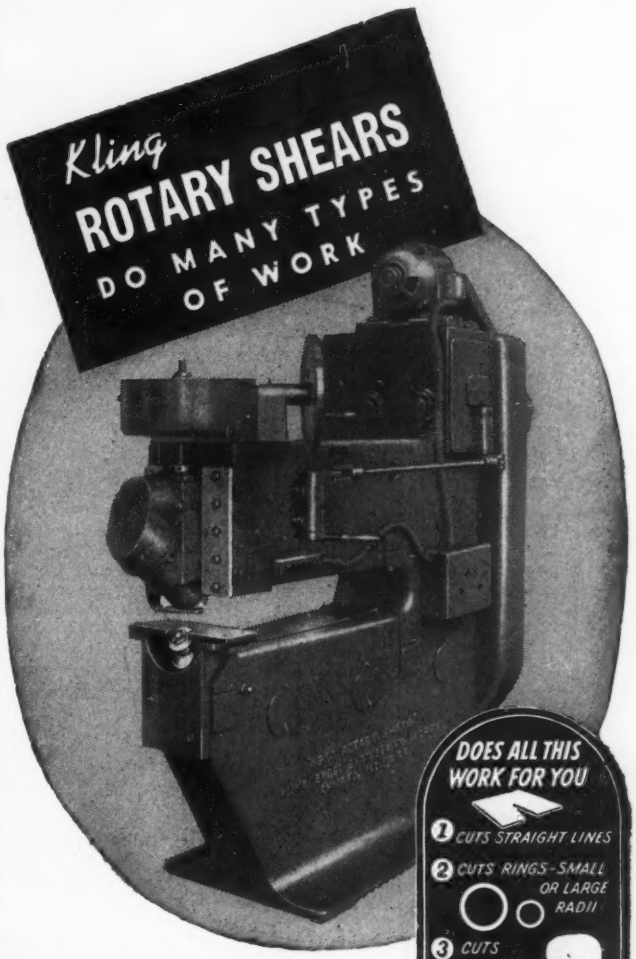

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facture and sell electric fixtures and appliances.

DETROIT—Dearborn Gear & Tool Co., 4300 Cabot, has been formed by Edward T. Arey with a capital of $100,000 to manufacture and sell gears, tools and machinery.

KALAMAZOO, MICH.—Western Industries Inc., 825 W. Walnut, has been formed by William Slavin with a capital of $100,000 to manufacture and sell automotive equipment.

MELVINDALE, MICH. — Detroit Industrial Spring Corp., 17755 Dorn, has been formed by Sigurd R. Peterson with a capital of $150,000 to manufacture and sell coil and flat springs.

MINNESOTA

MINNEAPOLIS — Archer-Daniels-Midland Co., 600 Roanoke Bldg., has awarded a $380,000 contract to Power Service Corp., 711 Wesley Temple Bldg., for construction of a power plant at 520 Malcolm St.

MISSOURI

ST. LOUIS—Roesch Enamel Range Co., 24th and W. Main St., Belleville, Ill., has awarded a $69,000 contract to L. O. Stocker Co., 1673 Arcade Bldg., for construction of a stove plant at Gustine Ave. and Delor St.

NEW YORK

BINGHAMPTON, N. Y. — Agfa Ansco Co., Division of General Aniline & Film Corp., 29 Charles St., will build a $2 million plant.

BUFFALO—Structural Steel Corp., 166 Dart St., will spend $500,000 on a construction project to include three buildings for fabricating structural steel.

DOUGLASTON, N. Y.—Hazeltone Electronics, 1775 Broadway, New York, will build a $150,000 factory on Little Neck Pkwy.

NIAGARA FALLS, N. Y.—Electro Metallurgical Co., Royal Ave., will build a $100,000 vacuum furnace pilot plant.

OHIO

MAYFIELD HEIGHTS, O. — Diamond Alkali Co. has rejected bids for a $2,500,000 administrative and research center on Mayfield Rd. at S.O.M Center Rd. Project is temporarily in abeyance.

RAYLAND, O.—Moscrip Mining Corp. has been formed by Louis Moscrip with a capital of $250,000 to take over some of the strip mining operations of Tomer Coal Co. here.

TOLEDO, O.—Toledo Plate & Window Glass Co., 1041 Utica St., has awarded a $100,000 contract to J. H. Berkebile & Son., 998 Whittier St., for construction of a factory.

TOLEDO, O.—Air-Way Electric Corp., 2101-15 Auburn Ave., has awarded an $80,000 contract to George W. Lathrop & Sons Inc., 1510 Montcalm St., for construction of a paint shop.

WARREN, O.—Mullins Mfg. Corp. has installed seven new presses costing more than $137,000 at its plant on University Rd. Purchase is part of an equipment modernization program which also includes installation of an enameling furnace.

PENNSYLVANIA

ALLENTOWN, PA.—Charis Corp., 7301 Linden St., has awarded a $100,000 contract to Earl W. Ecker Inc., 1420 Chelsea Ave., Bethlehem, for construction of plant additions.

BOYERTOWN, PA.—Boyertown Auto Body Works Inc., 27 S. Walnut St., has awarded separate contract, totaling $225,000 for construction of a plant.

FERNWOOD, PA.—Detroit Steel Products Co., 2250 E. Grand Blvd., Detroit, has awarded a $100,000 contract to Wark & Co., 1700 Sansom St., Philadelphia, for construction of a plant addition.

PITTSBURGH—West Penn Power Co., West Penn Bldg., plans a $15 million plant expansion program.

SOUTH DAKOTA

HIGHMORE, S. D.—Northwestern Public Service Co., Huron, has awarded a $100,000 contract to Frank Hawkins Construction Co. for erection of a power plant.

TENNESSEE

GREENVILLE, TENN. — International Minerals & Chemical Corp., A. N. Harmon, assistant superintendent, will soon call for bids for railroad tracks and grading site for new plant addition. Cost will be $100,000.

TEXAS

HOUSTON, TEX.—Spartan Tool & Service Co., Old Spanish Trail Rd., will build two plants at a cost of $68,000.

HOUSTON, TEX.—Merichem Co., 201 Velasco St., will spend $150,000 to reconstruct a soap, agricultural and industrial chemicals manufacturing plant.

HOUSTON, TEX. — Wyatt Metal & Boiler Works, Washington St., will build a $165,000 plant addition.

WEST VIRGINIA

FAIRMONT, W. VA.—Owens Illinois Glass Co. will build a $150,000 plant addition.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Concluded from Page 133)

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c, c.l. packed 6.05c, ton lot 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more. 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 10c, ton lots 10.25c, smaller lots 10.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: 17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo. fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.